RAILROAD GAZETTE

FRIDAY, FEBRUARY 25.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

Elections.—Augusta & Chattanooga, General C. A. Evans, President, re-elected.—Cape Breton, J. W. Heckman, Resident Engineer.—Delaware, Lackawanna & Western, Samuel Sloan, President; Fred. F. Chambers, Secretary; T. H. Gibbens, Treasurer.—Kansas City, Memphis & Birmingham, Geo. H. Nettleton, President and General Manager; R. H. Elliott, Chief Engineer; Jno. H. Sullivan, Superintendent.—Lehigh Coal & Navigation Co., Joseph Harris, President; Francis Yarnal, Vice-President.—Missouri Central, John D. Perry, President; Geo. W. Parker, Vice-President; M. H. Hawes, Secretary and Treasurer.—Tennessee Midland, A. S. Buford, President; W. D. Bethal, Secretary and Treasurer; T. C. Leake, Jr., Vice-President.—Western Colorado Railway Association, George H. Pamells, Arbitrator to fix percentages.—New York, New Haven & Hartford, Joseph Schofield, Superintendent of New York Division.

Personal.—S. N. Aldrich, President of the Central Massachusetts, is appointed United States Sub-Treasurer at Boston—Died: Solomon Jones, Elmira, N. Y.

Earnings.—January earnings, from 7 roads, all show increase. December earnings from 10 roads, 6 show increase, 4 decrease.

Traffic.—Anthracite coal shipments for week ending Feb. 19 show an increase of 8.9 per cent. over corresponding week last year; Eastern bituminous shows increase 32.5 per cent Coke an increase of 276.9 per cent. Cotton receipts, interior markets, for week ending Feb. 18 show gain of 3.6 per cent. compared with corresponding week of last year; Seaports show loss of 15.0 per cent. Cotton in sight is less than at same date last year by 19.8 per cent.

Changes and Extensions.—*Connecticut:* New York & New England will build a branch of the Springfield Division from Melrose, Conn., to Warehouse Point, 3 miles.—*Georgia:* Americus, Preston & Lumpkin will extend road 25 miles in Georgia.—*Indiana:* New Albany & Vincennes locates survey.—*Kentucky:* South Atlantic & Ohio is graded for 42 miles, and construction work is begun.—*Missouri*: Missouri Central will begin work of construction from St. Louis by March 1.—*Ohio:* Pittsburgh, Painesville & Fairport completes survey for new branch.—Cincinnati, Hamilton & Dayton will build from Dayton, O., 26 miles west to Eaton.—*Pennsylvania:* Lehigh Coal & Navigation will extend line to Scranton. Pennsylvania Railroad Co. completes survey for new branch from Peter's Creek to McDonald's Station, 18 miles from Pittsburgh.—*Texas:* San Antonio & Aransas Pass lays rails 14 miles northwest from San Antonio. Gulf, Colorado & Sante Fe extends line in northern part of state.—*Virginia:* Chesapeake, new line of road, is now in progress of construction.—Wisconsin and Michigan: Milwaukee & Northern is being extended 50 miles from Pike to Champion.

Leases, Sales, etc.—Kentucky Central will be sold at Lexington, Ky., on April 7.—Kansas & Gulf Short Line is sold to New York capitalists.—Ohio River & Lake Erie is sold to bondholders of the West Pennsylvania and the Shenango & Allegheny Valley.—Pennsylvania, Slatington & New England will be sold at Newton, N. J., April 20.

New Companies Organized.—Arkansas & Southern, organized at Little Rock, Ark.—Birmingham, Georgia & Florida, incorporated in Alabama.—Fort Smith & El Paso, incorporated in Arkansas.—Little Rock & Eastern, organized at Little Rock, Ark.—Mexican National, incorporated at Denver, Col.—Nebraska & Western is incorporated at Omaha, Neb.—Poughkeepsie & Delaware, organized in New York.

Reports and Financial.—Delaware, Lackawana & Western for year ending Dec. 31 shows gain of 4.0 per cent. gross, but loss of 6.1 per cent. net.—Lehigh Coal & Navigation Co., for year ending Dec. 31, shows loss of 12.9 per cent. gross, and 28.3 per cent net.—Milwaukee & Northern, for year ending Dec. 31, shows gain of 15.1 per cent. gross, and 32 per cent. net.—Northern Central, for year ending Dec. 31, shows loss of 0.2 per cent. gross, and 13.5 per cent. net.

Miscellaneous.—Milwaukee & Northern increases capital stock from $2,200,000 to $8,000,000.—Northern Pacific will have steamship line between Tacoma, W. T., and Alaska during summer months.—Texas & Pacific contracts for improvement on entire division between New Orleans and Shreveport, La.—Schuylkill & Lehigh Valley consolidates with the Pottsville & New York.—Missouri, Kansas & Texas scrip holders come to an agreement with Mr. Jay Gould.—New York, Chicago & St. Louis minority stockholders wish to institute proceedings against Brown, Howard & Co., of Chicago, to recover misappropriated money.—Chicago, Burlington & Quincy wins its suit against the stockholders of the Kansas Rolling Mill Co., involving $225,000.

Train Accidents in January.

The following accidents are included in our record for the month of January:

COLLISIONS.

REAR.

3d, freight on Cincinnati, New Orleans & Texas Pacific ran into some cars that had broken loose from a preceding freight near Cumberland River bridge, and pushed them on to the bridge, where they tipped off into the river.

4th, very early, freight on Shenandoah Valley ran into passenger train standing near Roanoke, Va. The passenger train had stopped to repair a broken hose and the entire crew were on the ground. The shock of the collision opened the throttle valve of the passenger engine and the train started off at a rapid rate with no trainman on board. The train is said to have run 15 miles, when it stopped for lack of steam and stood an hour before the crew came up and reclaimed their train. It is said that the freight train did not have sufficient notice to enable it to stop sooner.

4th, very early, freight on New York, Lake Erie & Western ran into rear of preceding freight near Painted Post, N. Y. Several cars were wrecked and burned up and one trainman hurt.

4th, night, near Elmira, N. Y., express on New York, Lake Erie & Western ran into locomotive, on which was a freight crew of 7 men, who had just left their train on the opposite track and were preparing to return to Elmira. The men were hurled in all directions, but only 4 were hurt.

5th, night, freight on New York Central & Hudson River ran into preceding freight in Syracuse, N. Y. Locomotive and several cars wrecked and thrown over an embankment.

6th, a. m., freight on Canada Southern ran into preceding freight standing near Aylmer, Ont. Several cars were wrecked. It is said no flag was out.

7th, a. m., passenger train on Chicago, Burlington & Quincy ran into rear of preceding passenger near Downer's Grove, Ill., wrecking one car and hurting 2 trainmen.

8th, a. m., passenger train on Wabash, St. Louis & Pacific ran into freight standing on main track near Forty-fifth street, Chicago, badly wrecking engine and several cars.

9th, early, freight on Wilmington & Northern ran into rear of preceding freight, stopped near Wawasset, Pa., wrecked caboose and 1 car, which were burned up with conductor and 1 passenger who were in the caboose. Two men on engine were injured.

10th, snow plow on Rome, Watertown & Ogdensburg ran into express train in Ontario, N. Y., injuring 3 trainmen.

10th, night, freight on Chesapeake & Ohio ran into rear of preceding freight at Brands Station, Va., injuring 3 trainmen.

11th, a. m., freight on Pennsylvania Railroad ran into rear of preceding freight at Marion, N. J.

11th, night, passenger train on Manhattan Elevated ran over a misplaced switch and into a baggage car standing on a side track at Fifty-third street and Eighth avenue, New York City. One trainman was hurt.

12th, night, freight on East Tennessee, Virginia & Georgia ran over a switch which had been purposely misplaced near Macon, Ga., and into some freight cars standing on siding, wrecking several cars loaded with oranges.

13th, p. m., passenger train on New York, Lake Erie & Western ran into some passenger cars standing on main track in the yard at Middletown, N. Y., wrecked 2 engines and 5 cars and blocked the track for some time.

15th, very early, East Tennessee, Virginia & Georgia passenger train ran into rear of Georgia Pacific freight on the joint track near Concord, Ga., wrecking several cars and injuring 2 trainmen.

15th, a. m., passenger train on East Tennessee, Virginia & Georgia ran into rear of freight near McDonough. Ga., wrecking locomotive and two cars.

15th, freight on Lake Shore & Michigan Southern ran over a misplaced switch and into a switching engine at Elmore, O., damaging engines and several cars.

16th, freight on Missouri Pacific ran into rear of preceding freight near McAllister, I. T., wrecking caboose and killing a passenger in it.

19th, freight on Louisville & Nashville broke in two while crossing the bridge at Newport, Ky., and the rear portion ran into the forward one damaging 10 cars.

21st, coal train on Philadelphia & Reading ran into rear of freight near Phœnixville, Pa., wrecking 10 cars.

22d, p. m., light engine on Boston & Maine ran into rear of passenger train in Charlestown, Mass., upsetting 1 passenger car and injuring 1 passenger.

23d, very early, mixed train on New York, Lake Erie & Western ran into a freight near Secaucus, N. J., derailing several cars. A danger signal was sent out, but apparently not far enough.

A freight following the mixed train stopped at a safe distance, but was run into by a work train following close behind it, wrecking 1 car, setting a fire which burned up the caboose and a carload of coffee.

24th, p. m., passenger train on New York, Lake Erie & Western ran into freight engine and caboose which had just run out from a side-track on the main track in the face of the passenger at West End, N. J., wrecking caboose and injuring 2 trainmen.

24th, night, freight on Louisville, New Albany & Chicago ran into a switching engine in La Fayette, Ind., tipping 2 flat cars into the Wabash Canal, and wrecking several other cars. One engineer hurt.

26th, very early, freight on Pittsburgh, Cincinnati & St. Louis ran into rear of preceding freight on the bridge over Monongahela River in Pittsburgh, Pa.

27th, freight on Norfolk & Western broke in two near Farmville, Va., and the rear section ran into the forward one, wrecking 5 cars, injuring one trainman.

27th, a. m., passenger train on Atchison, Topeka & Santa Fe ran into some freight cars which had broken loose and run back down grade near Wallace, N. M. The wreck caught fire and was destroyed. Engineer was badly hurt.

28th, freight on Missouri Pacific ran into switching engine in Independence, Mo., wrecking several cars.

30th, a. m., freight on New York, Lake Erie & Western ran into rear of a preceding freight in Owego, N. Y., wrecking the engine and caboose.

31st, very early, passenger train on Chicago, Burlington & Quincy ran into preceding passenger train which had been stopped by a stalled freight near Aurora, Ill., damaging engine and 2 sleeping cars. The standing train had sent out a danger signal, but the man came back too soon, and his train was struck by the following one before it had regained its headway.

BUTTING.

4th, night, butting collision between passenger and a stalled freight on Baltimore & Ohio near Republic, O. Both engines and several cars in each train were demolished and at once took fire and were consumed. At least 13 passengers were burned up in the wreck and several injured, though the names of only 5 injured have been reported. The freight was running on the passenger train's time.

4th, butting collision between freight and coal train on Chicago, Burlington and Quincy near Streator, Ill., killing 1 trainman and hurting 2. Orders were not properly delivered.

5th, a. m., butting collision between two freights on Missouri Pacific near Holden, Mo., wrecked both engines and 10 cars, injuring a fireman fatally and both engineers less severely. An operator's carelessness is given as the cause.

6th, butting collision between two freights on Union Pacific at Wamego, Kan., damaging both engines and several cars.

7th, p. m., butting collision between passenger train and light engine on New York Central & Hudson River near Auburn, N. Y. The passenger train was a new one just put on and the runner of the light engine apparently forgot that there was such a train.

9th, p. m., a coke train on Pittsburgh, Ft. Wayne & Chicago ran over misplaced switch and into a switching engine standing on siding in Allegheny City, Pa., wrecking both engines, fatally injuring engineer and fireman of switch engine.

15th, butting collision between two freights on Union Pacific at Fort Riley, Kan., damaging both engines and 2 cars.

17th, butting collision between two freights on Western & Atlantic.

17th, p. m., butting collision between snow-plow and freight train on Grand Trunk, at Lindsay, Ont., in a thick snow storm. The freight engine was forced up the inclined plane of the snow-plow, and, minus its front truck, was lodged upon the other engine and the plow several feet from the ground.

20th, night, butting collision between two engines on the Ocean Steamship Co.'s wharf in Savannah, Ga., injuring 1 trainman badly.

21st, a. m., passenger train on New York Central & Hudson River ran into an engine which was just backing out of the engine house at Poughkeepsie, N. Y. Engineer and fireman badly hurt.

23d, night, butting collision between 2 passenger trains on the Northern & Northwestern at Allandale, Ont., 5 passengers hurt.

24th, a. m., butting collision between two freights (one running backwards) on Junction road in Pittsburgh, Pa., wrecked 9 cars.

26th, butting collision between freight and passenger on Louisville & Nashville, near Bozeman, Ala., wrecking both trains, killing both men on the freight engine.

28th, p. m., butting collision between passenger and freight on Augusta, Gibson & Sandersville, near Bath, Ga. Both engines wrecked. The freight was running on the passenger train's time.

29th, a. m., butting collision between passenger and freight on Louisville & Nashville, near Montgomery, Ala. Engineer and fireman of freight killed; both trains badly wrecked.

29th, night, butting collision between switching engine and some freight cars in the yard of the Pennsylvania Railroad at Harrisburg, Pa.

CROSSING.

5th, freight on Chicago & Northwestern ran into a Chicago, Milwaukee & St. Paul passenger train at the crossing of the two roads in Owatonna, Minn., wrecking a sleeping car and damaging the freight engine.

6th, a. m., passenger train on Louisville, New Albany & Chicago ran into Lake Shore & Michigan Southern passenger train at the crossing of the two roads at 16th street, Chicago. The smoking car of the Lake Shore train was overturned, but no person was seriously injured.

11th, p. m., Lake Erie & Western passenger train ran into a Toledo & Ohio Central passenger train at the crossing of the two roads in Fostoria, O., derailing both engines and injuring one fireman. It is said that the signalman became confused and gave clear signals to both trains.

19th, a. m., passenger train on Second avenue line of the Manhattan Elevated road ran into a passenger train on the Third avenue line, at the crossing at Chatham Square, New York City, slightly damaging one car.

31st, Chicago & Northwestern freight ran into Chicago, Milwaukee & St. Paul freight at crossing in Chicago, damaging an engine and a car.

DERAILMENTS.

BROKEN RAIL.

3d, freight on Indiana, Bloomington & Western derailed by broken rail near Kenton, O.

3d, freight on Cincinnati, New Orleans & Texas Pacific was derailed by a broken rail at Reesville, Ala. Two trainmen hurt.

7th, passenger train on Louisville, New Albany & Chicago derailed by broken rail near Bedford, Ind. Engine and 2 cars damaged; 2 trainmen hurt.

8th, construction train on Spartanburg, Union & Columbia derailed by broken rail near Alston, N. C. One train man killed.

10th, a. m., passenger train on Rome, Watertown & Ogdensburg derailed near Rosiere, N. Y., by broken rail. Two passengers hurt.

10th, night, passenger train on Indianapolis & Vincennes derailed while running at a high speed near Indianapolis, Ind., by broken rail. The cars rolled down a high embankment, but only 2 passengers were seriously injured.

11th, a. m., passenger train on Chicago, St. Paul, Minneapolis & Omaha was derailed by a broken rail near Cameron, Wis., injuring one trainman.

12th, a. m., freight on Indiana, Illinois & Iowa struck a broken rail near Sunbury, Ill., derailing several cars, killing 1 trainman and injuring another.

13th, a. m., freight on Columbia & Port Deposit road struck a broken rail at Cullys, Pa., throwing 16 cars down a high bank. One brakeman went down with the wreck and was badly injured.

16th, very early, passenger train on Chicago & Iowa struck a broken rail near Sugar Grove, Ill., derailing all the cars but the first two, injuring 2 passengers.

16th, p. m., passenger train on Fitchburg road struck a broken rail at Westminster, Mass.; 4 cars were derailed, striking and overturning 6 freight cars on an adjacent track and blocking both main tracks for some time.

18th, freight on Cincinnati, Wabash & Michigan derailed by broken rail near Linwood, Ind., wrecking several cars.

18th, night, freight on Reading & Columbia struck a broken rail at Cocalico Bridge, Pa., badly wrecking 13 cars and knocking down bridge.

21st, very early, passenger train on Lake Shore & Michigan Southern struck a broken rail near Huron, O., derailing 2 cars.

26th, passenger train on Chicago & Northwestern derailed by broken rail near Grand Rapids, Dak., damaging 3 cars.

26th, p. m., switching engine on New York Central & Hudson River struck a broken rail in the yard at Buffalo, N. Y., and was tipped over, injuring fireman seriously.

LOOSE OR SPREAD RAILS.

10th, freight on Gettysburg & Harrisburg derailed by spreading of rails near Bonnybrook, Pa., several cars wrecked, 1 trainman hurt.

12th, p. m., car of passenger train on Chicago & Northwestern was derailed by spreading of the rails near Clybourn Place, Ill., injuring 1 passenger.

13th, a. m., passenger train of 8 cars on New York, Lake Erie & Western was completely derailed near Middletown, N. Y., by spreading of the rails, injuring 1 trainman. The train was running very fast.

19th, a. m., freight on Florida Railway & Navigation road was derailed near Waldo, Fla., by spreading of the rails.

24th, p. m., passenger train on Ohio Central derailed while running at a high rate of speed near Taylor's Run, O., by defective rail. The entire train was tipped over into the ditch, but the 15 passengers all escaped with slight bruises. "The stoves in the coach and express car were bolted to the floors, and the doors securely fastened," and the cars did not take fire. The track was blocked all night. The fireman was crushed between the tender and baggage car and killed.

BROKEN BRIDGE.

19th, five engines coupled together on the Louisville, New Albany & Chicago broke a trestle near Monon, Ind., and two of them went through, injuring 3 trainmen.

22d, a. m., mixed train on Gulf, Colorado & Santa Fe wrecked near Alvarado, Tex., at a cattle guard which had been weakened by fire and gave way under the train. One trainman was killed.

26th, a. m., freight on Charlotte, Columbia & Augusta broke through the Cave Creek trestle bridge near Lancaster, S. C. Six cars went down and were completely wrecked, killing one trainman and injuring another. The cars appear to have been derailed before they reached the trestle.

31st, a. m., engine of passenger train on Pittsburgh & Northern was precipitated in Girty's run, near Evergreen, Pa., by the breaking of a bridge. Engineer fatally hurt. The cause of the failure of the bridge is reported to have been a weakened foundation resulting from flood.

DEFECTIVE SWITCH.

3d, 4 cars of passenger train on Chicago, Burlington & Quincy derailed by broken switch near Grand River, Ia., injuring six passengers.

8th, a. m. passenger train on Dunkirk, Allegheny & Pittsburgh was derailed at Fredonia, N. Y., by broken switch-rod. Conductor slightly hurt.

6th, night, passenger train on New York, Ontario & Western derailed near Walton, N. Y., by broken switch. The engine collided with a car of rails standing on the side track near by, and also broke into a mill adjoining.

BROKEN WHEEL.

15th, night, 2 cars of freight on New York, New Haven & Hartford were derailed by broken wheel at Chestnut Hill, Conn., injuring 1 trainman.

17th, freight on Pittsburgh, Ft. Wayne & Chicago derailed by broken wheel near Laurel, Pa.

23d, very early, passenger train on Louisville & Nashville was derailed by broken driving wheel near Carmi, Ill. The engine was ditched and 2 cars badly broken, killing engineer and fireman and injuring 2 trainmen.

BROKEN AXLE.

4th, early, passenger train on Boston & Albany jumped the track at West Springfield, Mass., derailing 3 cars, which collided with standing cars on both sides of main track and immediately took fire and were destroyed. One passenger killed, 1 seriously injured, and 15 others and 3 trainmen slightly injured. Cause, a tender axle which had broken 4 miles back.

9th, night, freight on Pennsylvania Railroad was derailed at Shock's Station, Pa., by broken axle. The wreck was a bad one and blocked both tracks for 12 hours.

11th, freight on Delaware & Hudson Canal Co.'s road was derailed by a broken axle on a trestle in Kelley's, N. Y. The trestle was knocked down and 21 cars were piled up in a bad wreck.

11th, p. m., passenger train on Grand Rapids & Indiana derailed near Belmont, Mich., by broken axle. Two cars were tipped over on their sides, but there was a deep snow and no passenger was injured. One trainman hurt.

18th, night, snow plow on New Haven & Northampton jumped the track in Westfield, Mass., and struck a freight car on an adjacent side track. Cause, broken journal.

20th, a. m., freight on New York, Lake Erie & Western derailed by broken axle at Alden, N. Y., injuring three trainmen.

24th, a. m., coal train on Philadelphia & Reading was derailed at Connor Crossing, Pa., by broken axle.

LOOSE WHEEL.

17th, p. m., freight on Northern Central was derailed at West Junction, Pa., by loose wheel.

MISPLACED SWITCH.

3d, baggage car of passenger train on Baltimore & Ohio derailed by misplaced switch at Edgmoor, Ill.

17th, p. m., passenger train on Montpelier & Wells River was thrown down a bank by a misplaced switch, near Barre Junction, Vt., injuring 1 passenger.

30th, p. m., passenger train on Union Pacific derailed by misplaced switch at Almy Junction, Utah. The engine, mail and baggage car were piled up in a bad wreck; engineer killed and 2 trainmen injured.

CATTLE.

3d, a. m., construction train on Cincinnati, New Orleans & Texas Pacific struck a cow near Epps, Ala., and was thrown down a bank, killing fireman and injuring engineer.

14th, freight on Missouri Pacific struck a cow near Greenville, Tex., derailing engine and 8 cars. Engineer jumped and was killed.

SNOW.

18th, p. m., passenger train on Pittsburg & Western derailed at Callery Junction, O., by snow on the track.

LANDSLIDE.

22d, freight on Cleveland, Akron & Columbus derailed by landslide near Gano, O., wrecking engine and seven cars.

ACCIDENTAL OBSTRUCTION.

2d, early, freight on Fitchburg road was derailed at Wendell, Mass., by a bundle of newspapers dropped on the track from a preceding train.

MALICIOUS OBSTRUCTION.

22d, very early, freight on Louisville & Nashville derailed near Humboldt, Tenn., by a heavy oak plank placed on the track by some person who evidently intended to wreck a following passenger train. Engine, tender and 2 cars were ditched and fireman severely hurt.

WIND.

19th, a. m., freight on Denver & Rio Grande was blown from the track by a tornado at Monument, Colo., badly wrecking 4 cars.

30th, freight on Union Pacific blown from track by high wind near Marshall, Col.

RAIL PURPOSELY MISPLACED.

11th, midnight, passenger train on Missouri Pacific was derailed near Dunbar, Neb., by a loose rail from which several spikes had been removed by train wreckers. Engineer killed, 1 passenger and 1 trainman hurt badly, and 17 passengers slightly. This is said to have been the third attempt of the wreckers to kill this engineer.

17th, night, freight on Atlantic & Pacific struck a loose rail near San Jose, N. M., tipping engine into a ditch. The rails had been loosened by men who expected to derail an express train for purposes of robbery.

UNEXPLAINED.

1st, night, 10 cars of freight on Cincinnati, New Orleans & Texas Pacific were derailed near Sulphur Springs, Ga.

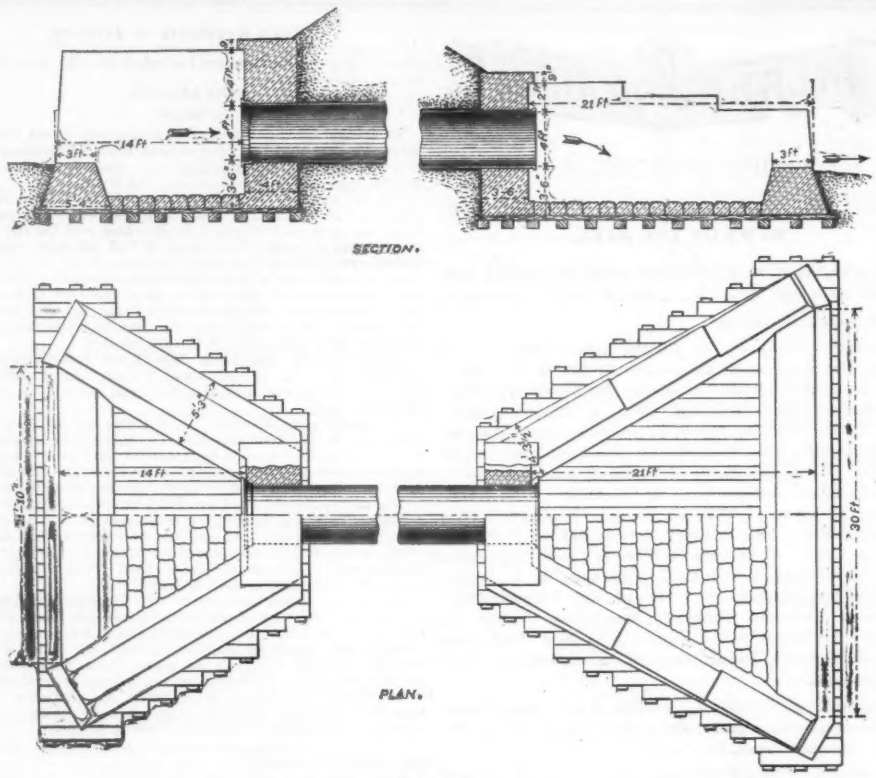


Fig. 1.

CHICAGO, BURLINGTON & QUINCY IRON PIPE CULVERTS.

3d, a. m., freight on Long Island Railroad was derailed near Jamaica, L. I.

4th, 2 passenger cars of mixed train on Dayton & Ironton derailed near Jamestown, O., and rolled down a bank.

6th, freight on Wabash, St. Louis & Pacific derailed in Essex, Ill.

7th, passenger train on Wabash, St. Louis & Pacific derailed at Horse Creek, Ill. Engineer was killed.

9th, p. m., freight on New York Central & Hudson River was derailed at Normansville, N. Y., throwing 21 cars into a creek 30 ft. below.

10th, a. m., passenger train on Chicago, St. Paul, Minneapolis & Omaha derailed near Chetak, Wis. One trainman hurt.

11th, a. m., freight on Illinois Central was derailed near Ashkum, Ill., hurting 3 passengers.

11th, p. m., passenger train on Boston & Maine was derailed near Everett, Mass.

12th, p. m., freight on Indiana, Bloomington & Western jumped the track near the bridge over Sandusky River, 9 cars were piled up in a bad wreck, and one of them, after reaching the bridge, tipped over and damaged the tender of a Baltimore & Ohio engine passing on an adjoining track.

12th, night, Lehigh Valley passenger train jumped the track near Attica, N. Y., and 5 cars were thrown on their sides. One passenger and 1 trainman hurt.

13th, 3 cars of passenger train on Toledo, Ann Arbor & North Michigan derailed, injuring 2 passengers and 1 trainman.

14th, night, freight on Richmond & Danville was derailed near Toccoa, Ga. Fireman hurt.

17th, passenger on Chicago, Milwaukee & St. Paul derailed near Garner, Ia.

18th, engine pushing snowplow on Chicago & St. Louis derailed near Streator, Ill. Superintendent hurt.

20th, p. m., sleeping car in passenger train on New York Central & Hudson River jumped the track at Tarrytown, N. Y.

23d, freight on Louisville, Evansville & St. Louis derailed near Hoffman's, Ind., wrecking 11 cars.

23d, p. m., freight on Utah Northern was derailed near Buxton, Mont., ditching 6 cars and caboose.

24th, p. m., passenger train on Toledo & Ohio Central was derailed near Sycamore, O., fatally injuring the fireman.

25th, very early, passenger train on Louisville, New Albany & Chicago derailed in Crawfordsville, Ind.

27th, a. m., passenger train on Port Jervis, Monticello & New York was derailed near Rose's Point, N. Y.

OTHER ACCIDENTS.

BOILER EXPLOSIONS.

10th, boiler of locomotive on Pittsburgh, Cincinnati & St. Louis exploded just as the engine was proceeding to cross the Gnadenhutten Bridge, Ohio, badly wrecking the engine.

23d, a. m., engine of passenger train on Belt Line in Buffalo, N. Y., blew out a stay-bolt, causing an escape of steam which badly scalded the fireman.

26th, p. m., engine on East Tennessee, Virginia & Georgia exploded its boiler when near Dalton, Ga., killing engineman and fireman.

BROKEN PARALLEL ROD.

18th, night, engine of passenger train on Intercolonial road broke a parallel rod when near St. Alexandre, P. Q. Engineer jumped and was instantly killed; fireman injured.

28th, p. m., engine of passenger train on Philadelphia & Reading broke a parallel rod when near Chalfant, Pa. The broken rod tore a hole in the boiler. The engineer and fireman jumped to escape the steam and were badly hurt.

BROKEN AXLE.

4th, night, freight on New York, Lake Erie & Western broke an axle under a freight car near Elmira, N. Y.

6th, p. m., engine of passenger train on Housatonic road broke an axle near Stockbridge, Mass.

8th, a. m., passenger on New Haven & Northampton broke an axle near Westfield, Mass. The car did not leave the track.

MISCELLANEOUS.

25th, p. m., a wheel broke under a car in a coal train on New York, Lake Erie & Western near Port Jervis, N. Y.

25th, p. m., a tire broke on freight engine on New York, Lake Erie & Western at Port Jervis, N. Y.

31st, very early, a spring under a mail car on New York, New Haven & Hartford broke near New Haven, Conn., necessitating the leaving of the car.

17th, night, car loaded with cotton in freight on Chesapeake, Ohio & Southwestern was discovered to be on fire at Paducah, Ky. The car was burned up and 4 charred bodies were found in the ruins, supposed to be those of tramps who had secreted themselves in the car.

25th, very early, a car load of powder in a freight train on Missouri Pacific exploded near Nevada, Mo., wrecking several surrounding buildings and breaking windows for miles around. Engineer and firemen hurt and 1 brakeman killed.

A summary will be found in another column.

Chicago, Burlington & Quincy Iron Culverts.

Continuing the subject of the Chicago, Burlington & Quincy barrel culverts, of which we recently gave cuts (p. 55), it is to be observed that with these culverts when placed under heavy banks, and made without stiffening rings, it was found expedient to use frames at 8 to 10 feet apart, made of heavy vertical sticks tied above and below the barrel by iron rods to prevent the flattening of the barrel by the superimposed load before the earth at the sides had become sufficiently compact to resist the pressure. With the 6 foot barrels, 12 in. by 16 in. verticals were used, and with the 4½ foot, 10 in. by 12 in. Where the iron rail rings are used the frames are not needed.

The iron culverts which we illustrate this week are of two kinds. First, Cast-iron pipes of standard patterns which are used up to 4 feet in diameter and are used for given areas in Iowa according to the inclosed table * subject to the condition that the water can be backed up so as to discharge through the culvert under a head of pressure.

Dimensions of Culverts.

Area Drained	Iron Pipe	Embankment
up to 15 acres.	2 ft.	diameter exceeding 9 feet.
" " 25 "	2 " 6 in.	" " " "
" " 60 "	3 "	" " " "
" " 90 "	3 " 6 in.	" " " "
" " 150 "	4 "	" " " "

Fig. 1 shows the manner of putting these culverts in, and the protection provided for their ends.

These culverts have done a great deal of hard work. In one case, owing to carelessness on the part of a contractor, one of them had to carry a flood of such volume as to back the water up 8 to 10 ft. over the pipe for 36 hours, producing a solid spout of water from the lower end of the pipe 12 to 15 ft. long of perfectly circular form. In this case the masonry was laid on rock, and the culvert was uninjured by the ordeal, although the bank over it narrowly escaped destruction.

The road has also built two culverts 7 ft. in diameter, as shown by Fig. 2.† These were to some extent experimental, the chief point to be determined being whether the pipe could be cast in segments, with the ribs bolting together, as per plan, and when cold retain their shape, free from warping and unequal contraction, so as to be put together without chipping, drilling or other work which would have to be done by skilled labor. This has proved to be perfectly practicable by leaving castings in the sand until cool.

The pipe is easily put together with common labor, and when in position makes a first class job.

It has also been found feasible to decrease the thickness, and consequently the cost, and subsequent castings will be made 1⅛ in. thick, instead of 1⅜ in. as shown.

The danger from choking with drift, which is a matter of some solicitude with the smaller culverts, is, of course, dimin-

* In a few cases double 4 foot pipes have been used, but these are no longer approved.

† The washers used on these are now made of pieces of boiler plate, and the packing is of tarred rope instead of lead.

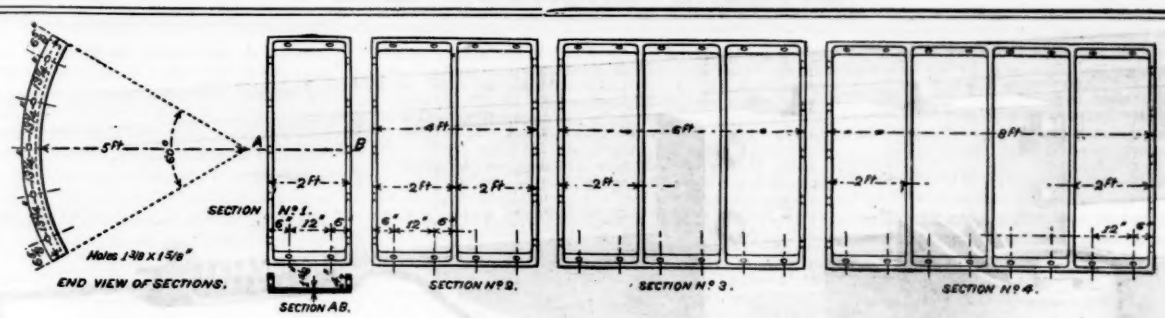


Fig. 2.

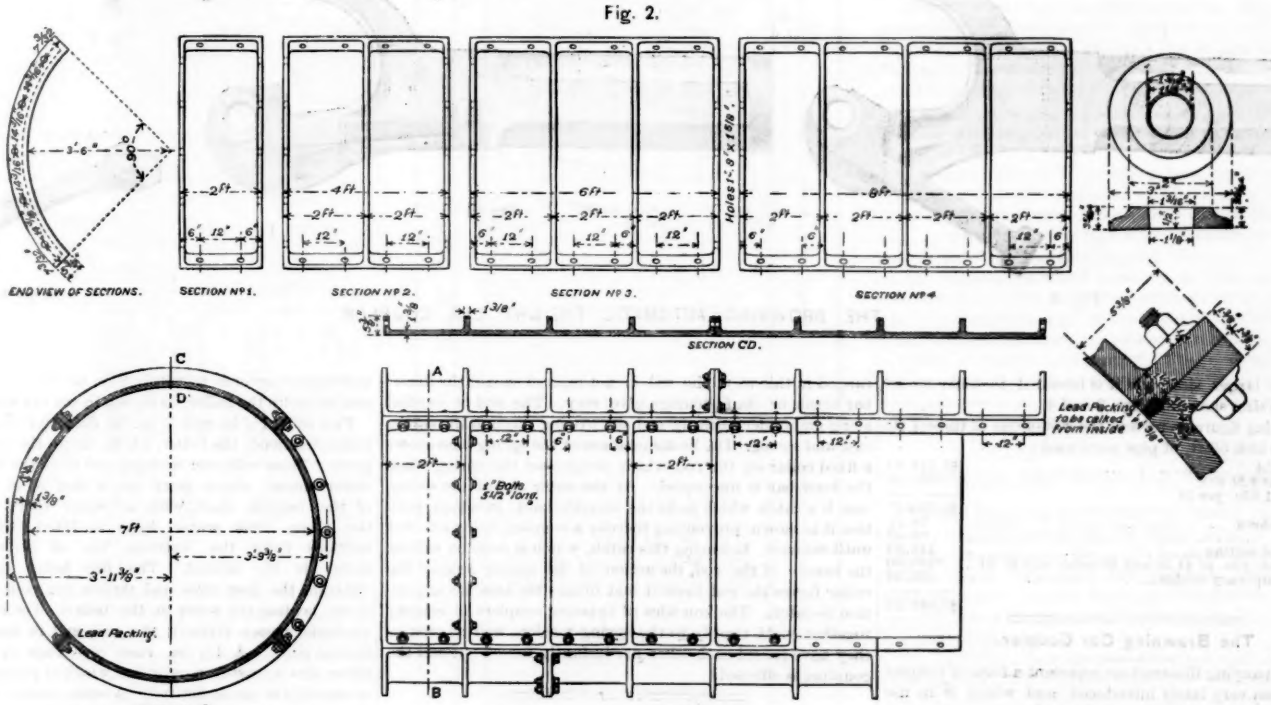


Fig. 3.

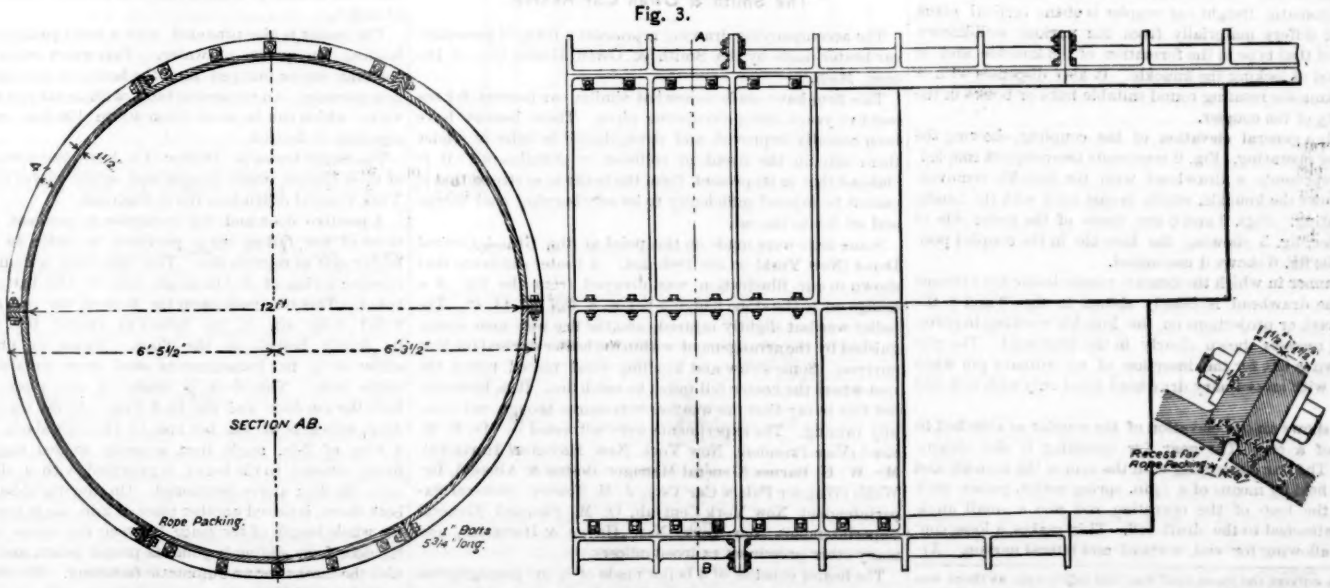


Fig. 4.

CHICAGO, BURLINGTON & QUINCY IRON CULVERTS.

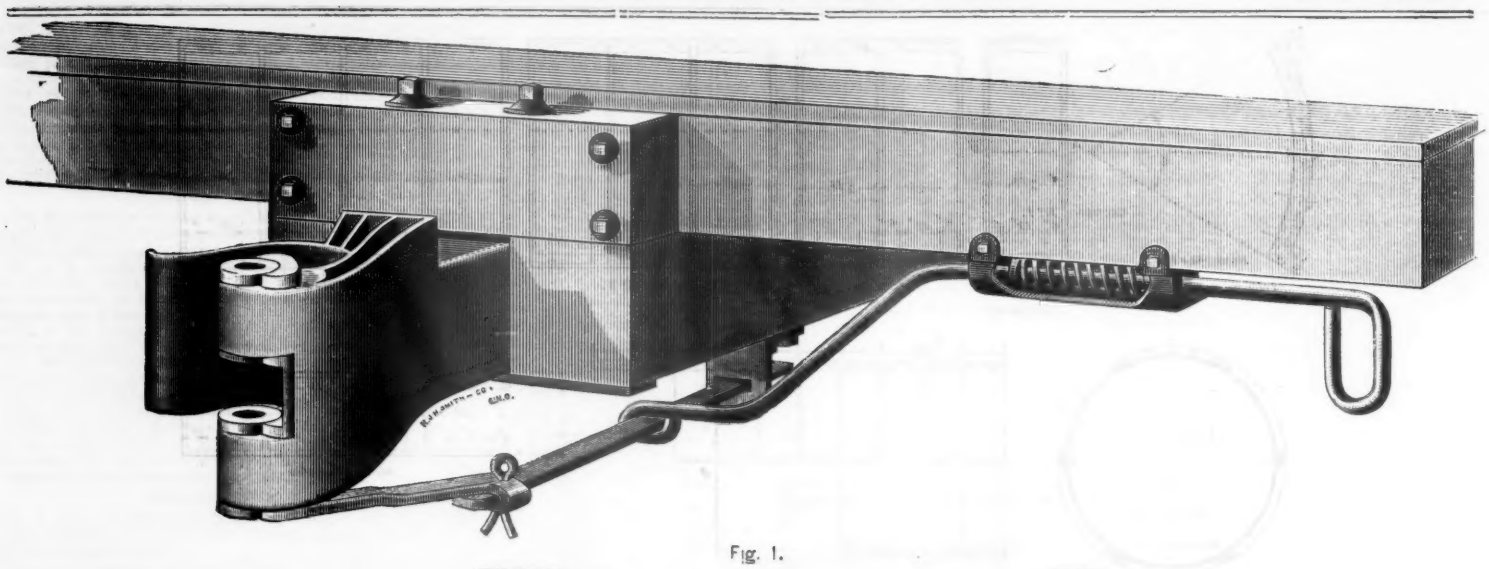


Fig. 1.

Fig. 2.

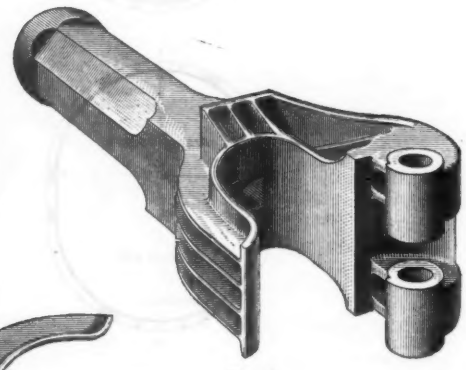


Fig. 3.

Fig. 6

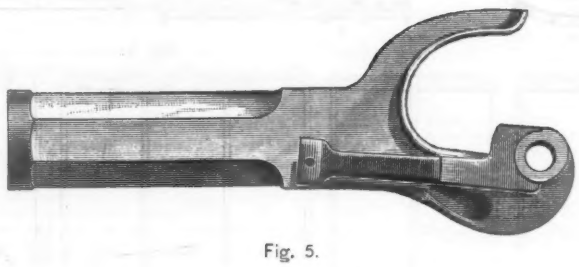


Fig. 5.

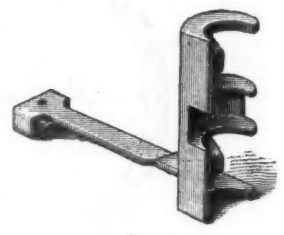


Fig 4.

THE BROWNING AUTOMATIC FREIGHT CAR COUPLER.

ished in the larger sizes, and it is intended to make use in future of the sizes shown in Figs. 3 and 4.

The following figures represent the cost of one of these 7 ft. culverts in which 50 ft. of pipe were used :

42 ft. at $26.554 +	$1,114.83
8 ft. special, at $29.415	235.32
Iron cost 1.55c. per lb.	
	$1,350.15
Bolts and washers	29.91
Unloading	17.52
Picking up and setting	148.95
Stone—70 cubic yds. at $1.50 and 60 cubic yds. at $1	*165.00
Removing temporary bridge	235.62
	$1,947.15

The Browning Car Coupler.

The accompanying illustrations represent a form of coupler which has been very lately introduced, and which is in use on the Cincinnati, New Orleans & Texas Pacific.

This automatic freight car coupler is of the vertical plane type, but differs materially from the various well-known couplers of that type in the formation of the knuckle and in the method of locking the knuckle. It also dispenses with a pin, the knuckle rotating round suitable hubs or bosses in the main body of the coupler.

Fig. 1 is a general elevation of the coupling, showing the handle for operating. Fig. 2 represents two couplers coupled. Fig. 3 represents a drawhead with the knuckle removed. Fig. 4 shows the knuckle, which is cast solid with the handle for operating. Figs. 5 and 6 are views of the under side of the coupler, fig. 5 showing the knuckle in the coupled position, while fig. 6 shows it uncoupled.

The manner in which the knuckle rotates inside the extreme end of the drawhead is clearly shown in figs. 3 and 4, the curved teeth or projections on the knuckle working in corresponding recesses shown clearly in the drawhead. The pin hole shown is left for the insertion of an ordinary pin when coupling with an ordinary drawhead fitted only with link and pin.

Fig. 1 shows an end elevation of the coupler as attached to the end of a car. The gear for operating is also clearly shown. The bar connecting with the arm of the knuckle and securely held by means of a ¼ in. spring cotter, passes back through the loop of the operating rod and a small angle bracket attached to the draft sill. This makes a loose connection, allowing for end, vertical and lateral motion. Arranged in this way, the rod is not injured should the draw bar break or its fastenings give way. The rod is carried along and underneath the end sill, passing through the spring case and spring. The broken section of the spring case shows a fixed collar on the rod which compresses the spring when the draw-bar is uncoupled. At the outer end of the spring case is a catch which locks the knuckle back, in which position it is shown, preventing thereby a coupling being effected until released. Releasing this catch, which is done by raising the handle of the rod, the action of the spring against the collar forces the rod inward and brings the knuckle in position to catch. The knuckles of opposite couplers in coming together yield readily to the spring tension, and as soon as they have passed each other are instantly forced out and the coupling is effected.

* In this culvert the stone used was laid as rip-rap, as there was no current, the usual form of wings and face walls being given it, except that a comparatively flat slope was substituted for the usual buttes.

The Smith & Owen Car Heater.

The accompanying drawing represents a form of passenger car heater made by the Smith & Owen Heater Co., of Detroit, Mich.

This firm have made somewhat similar car heaters for the last five years, using circulating pipes. These heaters have been recently improved, and strengthened in order to render them safe in the event of collision or derailment. It is claimed that in its present form the boiler is so strong that it cannot be injured sufficiently to let any burning coal escape and set fire to the car.

Some tests were made on this point at the Grand Central Depot (New York) on the 18th inst. A heater similar to that shown in our illustration was dropped from the top of a bridge on to the stone flagging below, a fall of 44 ft. The boiler was but slightly injured, and the fire was soon extinguished by the arrangement within the heater devised for that purpose. Some straw and kindling wood placed round the spot where the heater fell failed to catch fire. It is, however, but fair to say that the weather was damp, though not actually raining. The experiments were witnessed by Mr. E. M. Reed (Vice-President New York, New Haven & Hartford), Mr. W. H. Barnes (General Manager Boston & Albany), Dr. Webb (Wagner Palace Car Co.), J. M. Toucey (General Superintendent New York Central), O. M. Shepard (General Superintendent New York, New Haven & Hartford), and many other prominent railroad officers.

The heater consists of a boiler made of ¼ in. homogeneous steel, with 1¼ in. water space; inside diameter, 13½ in.; outside diameter, 15½ in.; extreme height, 42 in. The water space extends to within 8 in. of the top of the boiler, and encircles the boiler, as shown in the drawing.

Two coils, 1¼ in. and ¾ in. in diameter respectively, are connected inside the boiler, 14 in. from the top of the fire grate. These coils run upward and fit in the bottom of the water dome, which rests on a ring 8 in. from the top of the outside sheet, with a water space of 4 in. in the clear. This water dome is fitted with two connections from the extreme top of boiler where the water is the hottest. The fire being entirely below the coils, the heat rises and strikes the coils and the water dome, heating the water in the boiler. The hot water from the boiler passes through the coils and is heated to nearly boiling point. A 1¼ in. riser pipe runs from this water dome into a cast-iron cylinder, which is placed either inside or outside the car as desired. A water gauge, showing at all times the quantity of water in the heater, is placed on this cylinder.

The heater is also provided with a force pump, and a tank holding ten quarts of water. This water being always in the tank can be pumped into the heater at any time against any pressure. An expansion tank, with metal pop and safety valve, which can be set at from 40 to 120 lbs., can also be supplied, if desired.

The Smith Owen & Heater Co. have just furnished some of these pumps, water gauges and safety valves to the New York Central & Hudson River Railroad.

A positive door and top protection to prevent small particles of fire falling out is provided in order to make the heater safe as regards fire. This has been accomplished by riveting a ring of 2½ in. angle iron to the bottom of the boiler. This ring rests upon the floor of the car, and is provided with six ⅝ in. holes to enable the heater to be firmly bolted to the floor. Space is provided to allow a ¼ in. homogeneous steel door to slide in this angle iron. This door is made of one piece, covering both the ash door and the feed door. At the top of the feed door, which is at the bottom of the coils above described, a ring of 2-in. angle iron, securely welded together, and firmly riveted to the boiler, is provided with a slide to receive the door above mentioned. On the right-hand side of both doors, is placed another piece of 2-in. angle iron, running the whole length of the space between the doors to prevent the door from sliding beyond its proper place, and also furnish the means for an automatic fastening. The steel door is perforated with numerous ⅝-in. holes in order to allow the necessary draft to enter at the feed and ash doors. The top of

the boiler, 3-in. above the top of the water dome, is covered with a ¼-in. steel plate, perforated with ⅝-in. holes, as in the steel door. This plate is securely fastened to the boiler by heavy bolts.

The feed and ash doors and flues are thus closed and protected in such a manner that the inventor claims that any escape of fire or hot cinders is impossible, and that this boiler can be fired with a strong fire and upset from the top of a building into any inflammable material, such as kindlings, shavings, upholstery from car seats, etc., without in any way injuring the boiler or setting fire to the material.

The boiler is encased with Russia iron, with an air space of 1½ in. This casing rests upon a cast-iron base, and is provided with additional cast-iron doors, with slides to regulate the draft. These slides can be used by trainmen to temper the heat in the car, and any neglect or failure to attend to this duty will result in no danger in case of accident.

The heater is surmounted with a cast-iron top, and presents a handsome appearance, the top and base of casing and doors being nickel-plated.

In case of accident, this casing and the cast top and bottom would probably break like egg shells, as they present the same weak points as the ordinary car heater of the day; but it is claimed that the boiler inside is absolutely invulnerable, and can be rolled in any direction without injury.

The Kansas Railroad Commissioners' Report.

The statistical part of the Kansas Railroad Commissioners report does not contain much that is sufficiently digested for quotation. The reports of the separate companies are published in full; but the tables in which they are summarized hardly make a pretense of completeness. For instance, the net earnings, as given on p. 151, do not represent the difference between gross earnings and operating expenses; for the roads which run at a loss are simply left out of account. There are almost no train mileage or ton mileage statistics; and any averages by which we could compare the work done in successive years are left for the reader to make, if he has the time.

We give a few figures:

	1885.	1886.
Miles of road in Kansas, including side tracks	4,750	5,337
Capital stock	264,000,000	284,000,000
Bonded debt	310,000,000	308,000,000
Total stock and debt	595,000,000	612,000,000
Gross earnings	60,918,000	62,769,000
Operating expenses	31,976,000	31,869,000
Tonnage	15,555,000	16,437,000

Our readers will be amused to learn that on page 144 the gross earnings per mile are put at $81,744; the operating expenses per mile at $50,995; and the net earnings per mile at $34,384!

The record of accidents is as follows:

	Killed.		Injured.	
	From causes beyond their own control	By their own misconduct or want of caution	From causes beyond their own control	By their own misconduct or want of caution
Passengers	2	17	13	20
Employés	8	29	186	616
Others	1	39	2	78
Total	11	85	201	714

The report itself is much more valuable than the statistics. Kansas is in a position where its railroad development involves problems of great importance. It is building its railroads with great rapidity. In 1886 it built a thousand miles of road—a larger mileage than that of any other state for the same year. With this rapid development come the attendant evils of municipal subscriptions in aid of the new railroads. Up to 1884 such subscriptions on the part of counties, cities and towns had reached the aggregate sum of nine and one-half million dollars; since that time this sum has more than doubled, nearly ten millions having been voted in the course of a single year. The Commissioners wish to see the practice stopped.

"It must be evident from the number of new lines projected by responsible parties into every portion of Kansas, and the eagerness manifested by those companies to occupy territory in this state, that the voting of bond aid by cities, counties [and townships to aid their construction is rendered wholly unnecessary. Railroads will be built in Kansas in the future as fast as they will be needed, and much faster than the conditions existing will afford many of them a reasonable support, without the voting of another bond. But so long as the law remains upon the statute book permitting cities, counties and townships to vote bond aid, and thus burden themselves with taxation for a long period in the future, it will continue to be done. Though the law is more guarded in its provisions to prevent the practice of fraud than formerly, it will be inevitable that thousands of citizens will come to find themselves taxed to support enterprises of more than doubtful utility. The only way to protect the people is to repeal the law."

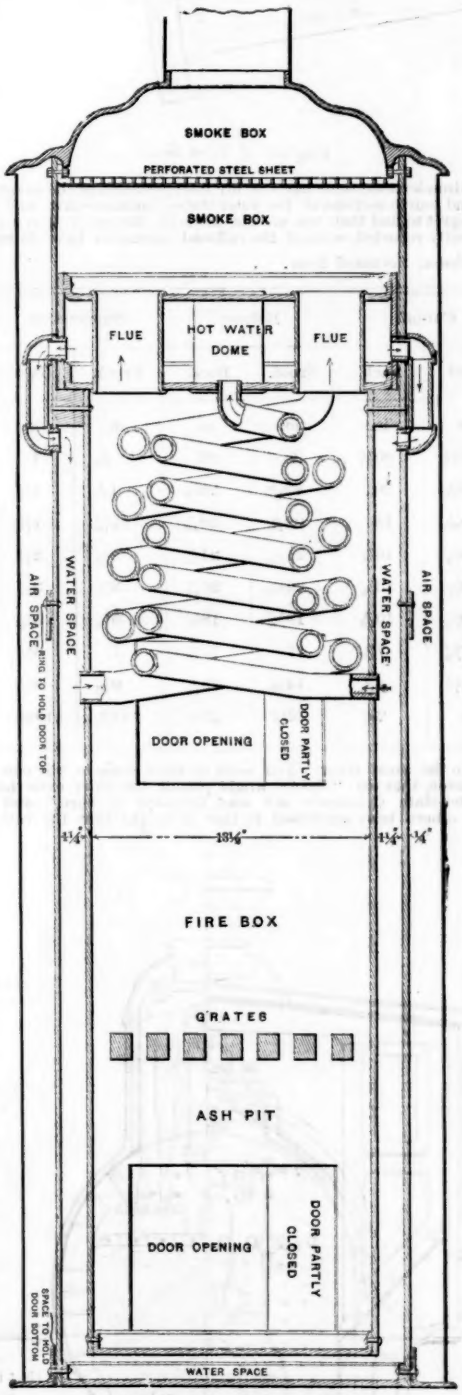
A large section of the report is devoted to the consideration of cases where a reduction in rates was demanded. The points involved are discussed with great ability; and the statements are so well put, that, though not specially new, they are worth quoting:

"In all active business enterprises something more than 'a profit equal to a fair rate of interest on the cash judiciously invested' is expected, to compensate for the risks, uncertainties and vicissitudes of the business. This is especially true of railroad investments, since these are recognized as the most uncertain and hazardous of all forms of investment offered to the public.

"The legitimate cost of a railroad is not represented by the amount of actual cash put into it, but the amount of securities it has been necessary to part with to obtain the cash with which to build it. The only resources open to a railroad company to raise money with which to build its road are the sale of its stock or bonds, or both. Those who advance their money upon the faith of this class of securities know that they incur all the uncertainties and hazards named above, and others which cannot be foreseen. The less promising the project appears to be, the less will the securities command in the market, and the cost of the road will be enhanced in proportion to the depreciation of the securities. These are the conditions upon which railroads have been built in the past, and the only conditions upon which they can be built in the future, and for the sufficient reason that the elements of uncertainty and risk can never be eliminated from the business.

"Then, again, these investments being attended with more than ordinary risks, as a rule men are not willing to hazard a large amount of individual capital in them; they absorb comparatively small sums from numerous persons scattered over the country and residing abroad. The great mass of those whose small sums are invested in railway shares have no direct voice in the management of the property. It may or may not be honestly and judiciously managed. If not, their interests will suffer. The temptation to use this species of property for speculative purposes, in which use the interests of the shareholders are lost sight of, is greater than surrounds any other. And this is another element of uncertainty and risk which is considered in making this class of investments.

"When it comes to considering suggestions to divide the reduction of the producer's profit between him and the carrier, a new order of questions arises. The farmer may change his tillage when one crop becomes unprofitable, and other forms of business capital may be changed from one investment to another—not always, it is true, without inconvenience and loss. But with railroads it is different; neither the character of the business nor the investment admits of the slightest change. The expenses and other charges incident to their existence and management remain substantially the same from year to year. Measures of economy when applied to these works mean the turning of hundreds of men out of employment, whose labor is necessary to keep them in an efficient state of repair, and increased jeopardy to those who use them."



SECTION THROUGH CENTRE

The Smith & Owen Heater.

The most important event of the year was the Missouri Pacific strike. A somewhat similar disturbance during the year preceding had been amicably settled. But the event showed how little reliance can be placed on such settlements, where there is no adequate means of enforcing them. The commissioners take strong ground against the strikers. They say that the strike was absolutely without a cause; that the assigned cause can hardly be considered to have been the real one; that the real reason was probably the refusal on the part of the receivers to meet certain demands of the Knights of Labor; demands which were clearly illegal, and which neither the court nor the receivers have any power to grant. These demands involved placing the affairs of the road in the hands of a committee which would have divided jurisdiction with the courts, and would have taken away all control from the managers, all efficiency and discipline from the working of the road.

We quote in detail a part of what is said on the subject.

"It seems to have been, as was afterwards avowed, the purpose in ordering the strike to measure the strength of the Knights of Labor organization with the Missouri Pacific Company. But it came to be, and all such attempts, carried on with the means employed in this strike, must result in becoming a measurement of strength with the constitution and laws, and the public authority of the country. To have surrendered to the strikers in this instance would have involved an abdication on the part of the company of all future management and control of its affairs and property. It would have been a surrender to unlawful violence, and have stimulated turbulence and disorder in every part of the country; disorganizing industries; bringing confusion to business and enforced idleness and distress to the working classes.

"Notwithstanding the salutary effect upon the public mind exerted by the firm attitude of Mr. Hoxie, the country has been visited with an epidemic of strikes and boycotts. This perturbed state of mind among a portion of the laboring classes has provoked much discussion in respect to remedies to be provided to prevent the recurrence of strikes and other similar disturbances. The method that finds most favor, and which, in the absence of anything original or novel, is the specific most usually recommended, is arbitration. And Congress and state legislatures devise and pass into law arbitration bills, which find their way into the statute books, and there sleep the sleep of death."

They criticise severely the arbitration bill passed by Congress, saying that it must be, as a rule, inoperative; that the settlement could not be enforced; that the method is not calculated to secure an impartial tribunal; that compulsory arbitration would be almost impracticable, and, if consistently carried out, would involve a loss of personal liberty on the part of the workmen. To voluntary arbitration they do not feel the same objection. They admit that it often will do a great deal of good, but they are not sanguine as to the possibility of carrying it out systematically, at least at present.

Where an unsuccessful strike has been instituted on frivolous grounds, which affected 5,000 miles of road, threw 10,000 men out of employment, and, as the Commissioners say, involved a loss of at least several millions of dollars, it is hardly to be expected that they should look with complacency on the organization which provoked it. They obviously prefer the older form of trades unions, going so far as to say that labor organizations embracing a promiscuous membership may perhaps be one of the most formidable obstacles to a system of friendly arbitrament. The whole tone of the report shows how the unwise use of power by a few designing men may create a vigorous reaction against the system which placed such a power in their hands.

Passenger Locomotive, Old Colony Railroad.

The accompanying illustrations represent a passenger locomotive recently built at the Old Colony shops in South Boston from the designs of Mr. J. N. Lauder, Superintendent of Rolling Stock. The engine was especially intended to run the boat express between Boston and Fall River. The chief peculiarities of the engine will be found in the boiler, blast pipe and cross heads.

The boiler has been already described and illustrated in the *Gazette*.* It is designed to carry a working pressure of 175 lbs. per sq. in. and is very strongly stayed and riveted. The longitudinal seams are double welted and riveted, and the mud ring is made 4 in. deep and double riveted, a practice rarely adopted in America, though common in Europe.

The arrangement of the blast-pipe is another leaf taken from European practice. The easy curves by which the separate exhaust pipes from the two cylinders are united in one blast nozzle is calculated to diminish the back pressure and secure a good draft on the fire with a large blast nozzle orifice. The blast being discharged centrally up the stack is not liable to strike the sides as with double nozzles. If carefully designed the steam exhausted from one cylinder has no tendency to flow down the other exhaust pipe, and so augment the back pressure in the other cylinder. A few experiments will enable the proper form of blast pipe to be decided upon.†

The cross-head and guides are of the form patented by Mr. F. W. Dean, of Taunton, Mass., and were described and favorably reported on by a committee of the Master Mechanics' Association in 1885. ‡ We are informed by Mr. Lauder that these guides are working very smoothly and are giving great satisfaction.

The valve gear has been very carefully proportioned and gives a very good distribution of steam. It will be noticed that the points of cut-off, etc., and the lead are very equal at both ends of the cylinder for the different notches. The distribution in the following table is given for forward gear

* The boiler and blast pipe were illustrated in detail in the *Railroad Gazette*, June 11, 1886.

† An account of experiments made by Mr. Charles Blackwell on this point will be found in "Recent Locomotives" (enlarged edition), page 62.

‡ See report of Master Mechanics' Association, 1885 plate 40 and page 107.

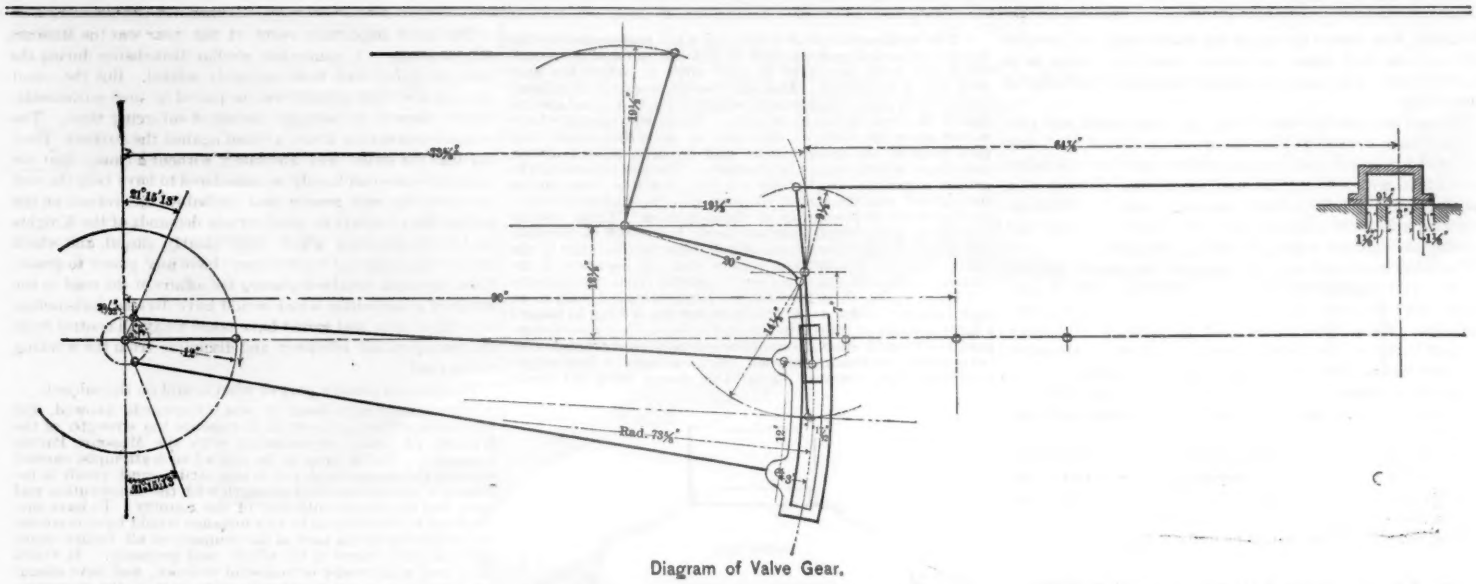


Diagram of Valve Gear.

only. As the engine is chiefly intended for express service, the distribution in backward gear is comparitively unimportant:

Table of Distribution of Steam, Forward Gear.

Notch.	Lead.		Cut-off.		Release.		Suppression.	
	Front.	Back.	Front.	Back.	Front.	Back.	Front.	Back.
	in.	in.	in.	in.	in.	in.	in.	in.
1	1/32	Exactly similar.	20 13/16	20 29/32	23 1/16	23	7/8	1
2	3/64		20 5/16	20	22 13/16	22 7/8	1 1/16	1 1/8
3	7/32		18 5/16	18	22 3/16	22 1/16	1 13/16	1 13/16
4	0		16 1/4	16 1/4	21 5/8	21 5/16	2 5/8	2 11/16
5	11/64		13 1/4	13 1/4	20 1/16	20 5/16	3 1/16	3 1/8
6	3/16		10 1/8	10 5/16	18 5/8	18 3/4	5 5/8	5 1/4
7	7/32		7 5/8	7 5/16	17	17 5/16	7	6 11/16
8	15/64		4 11/16	4 5/16	14 3/16	15 5/16	9 1/16	8 11/16
Centre	1/4		3	2 1/2	12 13/16	13 1/16	11 5/16	10 1/16

The leading dimensions of the engine are fully shown on the engraving, but are repeated in the subjoined list for the sake of convenience of reference:

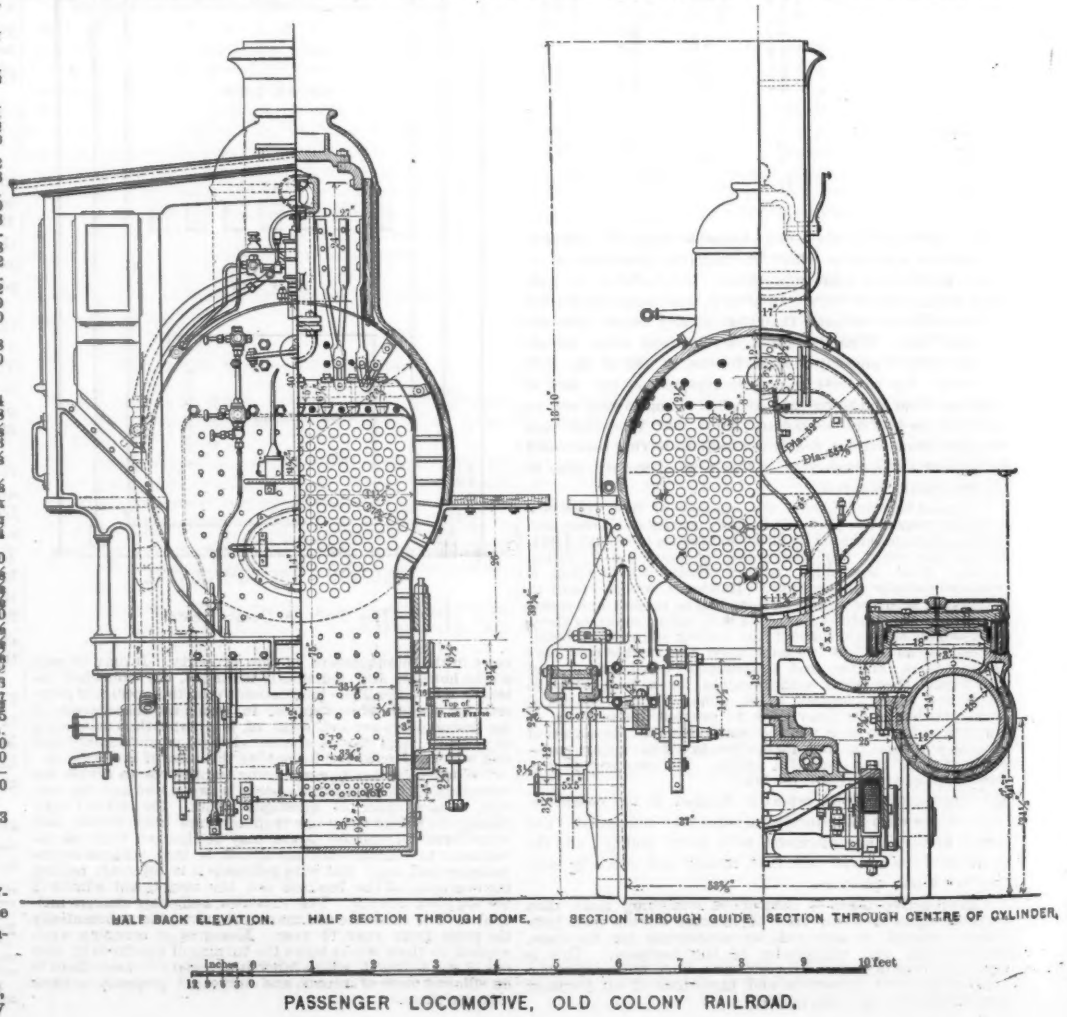
Boiler, Otis Steel.	Inches.
Diameter of shell inside smallest plate	52
Thickness of plates	7/16
Fire-box, Otis Steel.	
Length inside	78
Breadth inside	35½
Depth inside to bottom of mudring	75
Thickness, side and door sheets	5/16
Thickness, crown sheet	½
Thickness, tube sheet	7/16
Tubes, number 224:	½
Diameter outside	2
Length	138
Heating Surface:	Sq. ft.
Tubes (external)	1,310
Fire-box	138
Total	1,448
Grate area	19.2
Wheels:	Inches.
Driving, diameter of centre	62
" " on tread	69
Truck, Paige spoke, steel tired, diameter on tread	30
Axles, hammered iron:	
Driving journals, diameter and length	8 × 8
Truck " " " "	5½ × 10
Guides, cast iron, Dean's Patent:	
Cylinders:	
Diameter and stroke	18 × 24
Ports, length	18
" width steam	1⅛
" " exhaust	3
" " bridges	1⅛
Valves, Richardson's balance:	
Outside lap	⅞
Inside "	1/32
Lead in full gear	1/32
" " mid gear	¼
Valve Gear, etc.:	
Length of connecting rod	90
Centre of driving axle to centre of rocker	73⅝
Rocker arms, both alike, length	9½
Reversing arm, length	19¼
Lifting arms, "	20
Centre of rock shaft to centre of lifting shaft	19¼
Link hanger, length	14½
" radius	73⅝
" distance between pin-holes	1½
" " " " and centre-line	3
Saddle-pin set back from centre-line	1½
Eccentrics throw	5
Weight of Engine:	Lbs.
Drivers	61,700
Truck	34,300
Total	96,000
Tractive Power per lb., average pressure in cylinders, with tires 3 in. thick	114.3

Commissioner Fink on Inter-state Commerce.

In a telegram to the Chicago *Tribune*, of which the following is a copy, will be found Commissioner Fink's reply to the comments made on his interpretation of the Inter-state Commerce law:

To the Editor of the Chicago Tribune:

I was surprised to see by your editorial of Friday, Feb. 18, which only came to my notice to-day, that you have entirely misunderstood some parts of my interpretation of the second and fourth sections of the Inter-state Commerce law; and I regret to find that you are not alone in this, as, if it is correctly reported, some of the railroad managers have fallen into the same error. You seem to have come to the conclusion that my "theory would permit the chief evils the Inter-state Commerce act was intended to cure," and as others have expressed it, that it meant that the railroads could proceed with their business very much as if there were no law. In this you are greatly mistaken, and I am at a loss to understand how such a construction can be put upon anything I have said. What I did say was that the railroads may proceed as they have heretofore where they are in conformity with the present law and its intent and spirit; that they could continue to charge more for a short haul than for a long haul, if it were justified by the circumstances and conditions surrounding the case; that is, if it were reasonable and just. It goes without saying that if the railroads fail to comply with the law, and do not carry out these principles, they will be punished, and properly so. I was induced to express these views because there have been interpretations put upon the law, which, if acted upon, would cause great obstruction to commerce and great injustice to shippers, not to mention the injustice to the railroad companies, and I take the ground that any interpretation which would bring about that result is not justified, as the intention of the act was simply to correct abuses, not to create new ones. I hold that there are cases in which the railroads are justified in charging more for shorter than for longer hauls, and there are cases where it is not justified. You agree with me in this. I only advocate that where there is justification for this practice it be continued, and let it be stopped where there is none. The law will, doubtless, have a most excellent effect in stopping unjust and unreasonable charges. It ought not to go further and also stop competition and its beneficial effect upon commerce, which would be the case under an absolute prohibition of charging more for a shorter than for a longer haul. I have only advocated, as I have always done, that the railroad charges should be reasonable and just, and I may be permitted to say here that for the last 10 years my efforts have been directed almost exclusively toward carrying into practice the principles laid down in the Inter-state commerce law, and I desire nothing more than that this law should be successfully administered without resulting in the injurious consequences which would be sure to follow, both to the people and to the railroads, if a wrong, narrow and impracticable interpretation were given to it, either by the railroad managers, the


HALF BACK ELEVATION.
HALF SECTION THROUGH DOME.
SECTION THROUGH GUIDE.
SECTION THROUGH CENTRE OF CYLINDER.
Inches 0 1 2 3 4 5 6 7 8 9 10 feet
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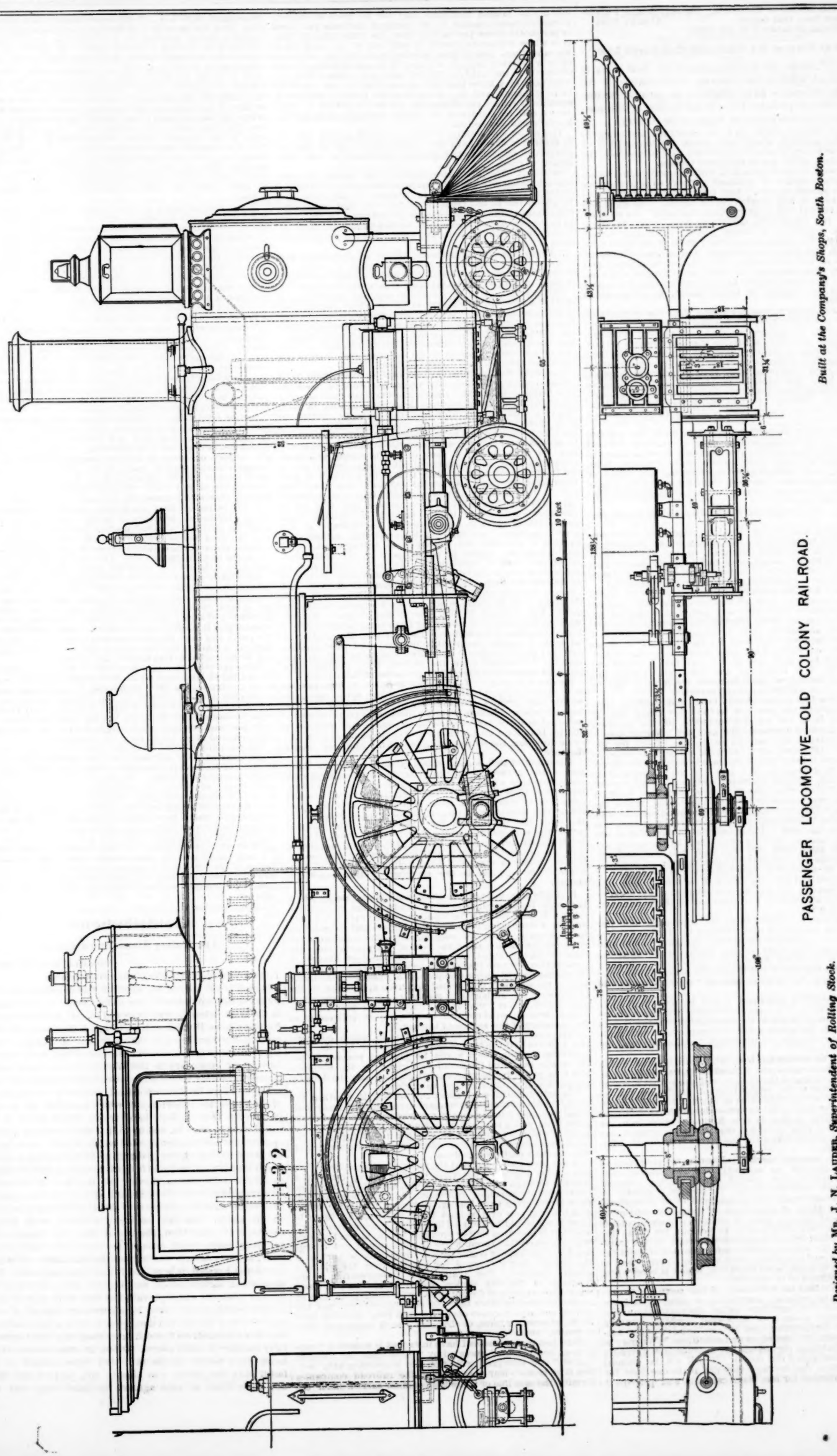
PASSENGER LOCOMOTIVE, OLD COLONY RAILROAD.



PASSENGER LOCOMOTIVE—OLD COLONY RAILROAD.

Designed by MR. J. N. LAUDER, *Superintendent of Rolling Stock.*

national commission or the courts. The only danger I apprehend comes from that source. ALBERT FINK.

NEW YORK, Monday, Feb. 21, 1887.

Another View of the Inter-state Commerce Law.

Mr. W. P. Shinn, the Vice-President of the New York & New England, sends us the following interpretation of the Inter-state Commerce Law. Owing to its peculiar circumstances, this road probably has a larger interest in this question than any system of similar length in the country :

This law, like all others, is to be construed according to its language and as a whole, and where the language is of doubtful meaning, it must be construed with reference to the general intent of the law as expressed therein.

The general intent of the law is, without question, to change the existing customs of common carriers so as to do away with some alleged abuses. Any interpretation which loses sight of this fact will clearly miss its object. The whole bill is repressive and reformatory in its character. In no other way can the remarkable deviations from what has been heretofore considered as sound judicial proceeding be accounted for. The most extraordinary mode of procedure is are authorized, and the most ordinary and generally accepted principles of law as defining the relations of plaintiff and defendant, of accuser and accused, are changed, and even reversed. This must be done to accomplish some object, and that object can only be, as before stated, to put an end to alleged abuses.

Without stopping to consider at this time the remarkable provisions of the law by which (see last clause of Section 13), persons having no interest at stake are allowed to become complainants, persons complaining who may have a perfect remedy at statute or common law are allowed (see Section 16) to bring their action in equity and still are not debarred (see Section 22) from prosecuting their remedies at common or statute law. The relations of plaintiff and defendant as to the burden of proof are by the finding of the Commission reversed (see Section 14), and thereafter the defendant, whether in civil or criminal suit, is obliged to prove himself innocent.

These and many other other deviations from the practice heretofore found reasonable and proper in courts of this and other English-speaking countries, certainly show an intent to make a material change in the existing state of things. With this fact in view, I will consider the meaning and effect of the principal sections of the act, those by which the course and practice of common carriers is to be determined, viz., Sections 2, 3, 4 and 6.

Section 1, after defining to whom this act shall apply, provides :

"All charges made for any service rendered or to be rendered in the transportation of passengers or property as aforesaid, or in connection therewith, or for the receiving, delivering, storage or handling of such property shall be *reasonable* and *just*, and every unreasonable and unjust charge for such service is prohibited and declared to be unlawful."

This clause is highly proper as a sentiment. No one would dispute the assertion that all charges of the character referred to should be reasonable and just, but what, we are compelled to inquire, is the effect of this language in a law. The question whether any rate is reasonable and just, is a question of fact, and therefore for the jury. This clause makes every rate charged for inter-state transportation subject to review by a jury, and if the jury find it unjust and unreasonable, it is prohibited and unlawful. For the full effect of this finding, in case it be made, reference is had to Section 8, which will be considered hereafter.

This Section does not necessarily infer that existing rates are not reasonable and just, nor, on the other hand, does it provide any basis for the determination of the question whether or not they are reasonable and just. Neither does it leave the question to the carriers to decide, except for the time being. Of course, each carrier is at liberty to make its own rates, and it must make them on a basis which its officers believe to be reasonable and just. If the judgment of its officers is good, and their views are sustained by the verdict of the Commission when the matter is submitted to it, a *prima facie* case is made in favor of the carrier which the complainant will have to overcome in case he pursues the matter beyond the Commission, and seeks a verdict in an action at law before the court. But in case the Commission should find that the rates so carefully established by the carrier are unreasonable and unjust, they are then unlawful and prohibited until the decision of the Commission is set aside by the verdict of a court or jury before whom the decision of the Commission will have the effect of a prima facie case against the carrier. In case the final decision of the court or jury is against the carrier, it carries with it the penalties set forth in Section 8.

The question as to whether rates are reasonable and just will have to be considered with reference to (1) cost of rendering the service charged for, (2) the comparative relation to rates charged for other similar traffic; while upon the other hand, in fixing the rates, the carriers are constantly restricted by competition and required to arrange their rates upon that highly objectionable basis of "what the traffic will bear."

From the foregoing statement it will be seen that while Section 1 appears to be a mere sentimental expression of the basis which should obtain in the establishing of rates, it is in effect the key to the whole act, as it brings every rate made under the act within the cognizance of the Commission, the court and the jury.

Section 2. This section has been commented upon as though it provided a basis upon which tariff rates were to be made, but a careful reading of the section will show that it has no relation whatever to the establishing of tariff rates, but, on the other hand, it is a prohibition in exact terms of evasion of tariff rates by any of the numerous devices heretofore used to that end. This section is free from objection from the carrier's point of view, provided that its interpretation can be satisfactorily established and made free from doubt. The section provides :

"That if any common carrier, subject to the provisions of this act, shall directly, or indirectly, by any *special rate, rebate, drawback* or *other special device*, charge, demand, collect or receive from any person, or persons, a greater or less compensation for any service rendered, or to be rendered in the transportation of passengers or property subject to the provisions of this act, than it charges, demands, collects or receives from any other person, or persons, for doing for him or them a *like* or *contemporaneous service* in the transportation of a like kind of traffic, *under substantially similar circumstances and conditions*, such common carrier shall be deemed guilty of unjust discrimination, which is hereby prohibited and declared to be unlawful."

It will be seen that the whole aim of this section is to prohibit special rates, rebates, drawbacks or other devices, the giving of which shall constitute unjust discrimination. The two clauses which make it of somewhat doubtful meaning are "like or contemporaneous service" and "under substantially similar circumstances and conditions." We may as well assume that those clauses will be construed pretty broadly by the Commission and the courts. It will not be claimed under this section that carriers may not make one rate for carloads and another for less than carloads, and perhaps it will not be claimed that rates may not be made to shippers whose shipments amount to one hundred carloads per week or per month lower per carload than the rates made to shippers whose shipments amount to only one or ten carloads in the same time. But all these varying rates and the conditions upon which they depend, will need to be set forth clearly and distinctly in the tariff, so that all who may come within the conditions may know that they are entitled to the rates attaching thereto, and any attempt on the part of carriers to equalize or reduce the charges by any secret rebate or other device will be construed as unjust discrimination and unlawful under this section.

The writer sees nothing to object to in this section and believes that it should have the cordial support of all railroad companies, but this section gives no assistance in the establishing of rates.

Section 3. The first paragraph of this section provides against giving any undue or unreasonable preferences and is entirely proper provided that in carrying it out, reasonable judgment can be had from the parties who must decide what constitutes undue or unreasonable preference. In this case, as in the case of rates being reasonable and just the final arbitrament is with the court and jury. The last paragraph of Section 3 provides tha

"Every common carrier shall afford all reasonable and proper and equal facilities for the interchange of traffic between their respective lines, etc., and shall not discriminate in their rates and charges between such connecting lines."

This expression is of very doubtful meaning and effect. It will be noticed that, whereas in the previous section that which is prohibited is "*unjust*" discrimination, in this section it is "*discrimination*" which is made unlawful regardless of whether it is unjust or not. There is no proviso as to like conditions and circumstances, but an absolute prohibition of any discrimination so far as rates and charges are concerned between such connecting lines.

The word "discrimination" is used in connection with common carriers as though discrimination were in itself objectionable or unlawful. Discrimination is the exercise of a sound judgment and is required in all business, and, in fact, in all the walks of life. How any traffic is to be carried on with connecting lines without discrimination, I fail to see. If the expression quoted is to be construed literally, then it will be necessary for every common carrier to have an arbitrary rate for each article or class of freight coming to it from connecting lines, and to charge all alike, regardless of where the freight comes from or where it goes to, provided it goes from and to the same point on the carrier's own line. Can this be the meaning of this section? If not, what meaning can be attached to it? It is contended that this act is not designed to break up the making of through rates and dividing them in proportion to the mileage of the several carriers, "pro rata" as it is ordinarily termed, and Section 6 provides for schedules of through rates to be established, but makes no provision as to the basis upon which they shall be established. The only construction of this section which can be made to harmonize with Section 6 is that which assumes that the discrimination in rates and charges between such connecting lines prohibited in Section 3 applies only to traffic coming from the same or similar points and destined to the same or similar places, and yet such an interpretation is very far from being justified by the literal wording of the section. The fact that the qualifying adjective "unjust" is omitted before the word discriminate, and that the expression "under like conditions and circumstances" is omitted from the section, both militate very strongly against any literal interpretation of this section.

Section 4 provides "That it shall be unlawful for *any common carrier* subject to the provisions of this act to charge or receive any greater compensation in the aggregate for the transportation of passengers or for like kind of property *under substantially similar circumstances and conditions* for a shorter than for a longer distance over the same line in the same direction, the shorter being included within the longer distance."

The intent of that portion of this section is not doubtful. One of the gravest complaints that has been against railroads, and that which has been the cause of more restricting legislation than any other, has been the fact that in many cases freight was carried from competing points for rates lower than were charged upon the same kind of freight over the same line of railroad for a less distance, and included within the same points that the longer haul covered. It cannot be questioned, therefore, but that this section aimed at a complete prohibition of such practice when the transportation is "under substantially similar circumstances and conditions." Now what is the meaning of this qualifying clause?

It clearly does not refer to the circumstances under which the traffic is obtained, or in other words, to the competition for it. It must refer to the conditions of the cars being fully loaded, of their being loaded by the shippers and unloaded by the consignees, as the case may be, and other conditions and circumstances which affect the cost of transportation. The clause certainly cannot refer to the existence or absence of competition, because that is the very cause which has led to the unjust discrimination complained of; besides in the latter part of the section it is provided that upon application to the Commission for authority in special cases, the Commission after investigation "may from time to time prescribe the extent the designated common carrier may be relieved from the operation of this section of this act."

This proviso clearly refers to the cases in which competition requires that the charge shall be made less for the long haul than the rate which would be just and reasonable for the shorter haul, and the permission given by the Commission is to prescribe the extent to which that may be done by the particular common carrier authorized.

The only doubtful point about this section is whether the term "under substantially similar circumstances and conditions" will apply in the case of any particular railroad to the point from which the particular freight is shipped and the point to which it is destined, or whether it only applies to the conditions and circumstances affecting its transportation on that carrier's particular railroad.

It has been contended that the term "common carrier" in this section applied to the whole through line or route upon which a through rate might be given, and which might include several companies' railroads. As, for instance, that upon a rate given from Chicago to Boston, the traffic under which would pass over at least three railroads, all three of those roads would be included in the term "common carrier," and that this section simply provided that so far as that rate was concerned that through line or route should not charge less for a like kind of traffic passing over only a portion of the distance than it charged for passing over the whole or greater distance. But against this interpretation is the language of the 6th section, which says, "and in cases where passengers and freight pass over continuous lines or routes operated by *more than one common carrier*, and the *several common carriers* operating such lines establish joint tariffs of rates, or fares, or charges for such continuous lines or routes," etc.

Here just such a case as I have instanced is termed a "continuous line or route" operated by "more than one common carrier," and interpreting Section 4 in connection with Section 6, it seems clear that each of the railroad companies forming the said line or route is a common carrier under the meaning of Section 4. It has been claimed that the expression "over the same line," in Section 4, indicated that the term common carrier referred to a continuous line or route, but reference to Section 1, which states "the term railroad as used in this act shall include all bridges and ferries used or operated in connection with any railroad, and also of the road in use by any corporation operating a railroad, whether owned or operated under a contract, agreement or lease," etc., indicates that a common carrier may have several roads or lines of railroad, and this section is not to be made to apply where the shorter haul is one line of that company's railroad and the long haul is on another line. As, for instance, the rate to be charged on the Philadelphia & Erie Railroad, which is operated and controlled by the Pennsylvania Railroad Co., is not to be governed by the through rates charged on the main line of the Pennsylvania Railroad. This, I think, disposes effectually of the claim that the word "line" in this section has any significance other than that I have stated.

If my interpretation is correct, each common carrier owning a railroad which forms a part of a "continuous line or route," receives its *pro rata* share of the through rate. The question is, therefore, can such common carrier charge upon the same kind of freight passing over its line in the same direction for a shorter distance any more than its *pro rata* share of such through rate. Taken in this view, the expression, "under substantially similar circumstances and conditions," may be held to include as one of the conditions that the freight upon which the *pro rata* rate is accepted is carried under a through rate for a long distance, while the other is not so carried, or is carried under a through rate from a different direction, and, therefore, reaches the carrier under *dissimilar* "circumstances and conditions." It can be clearly maintained that unless this latter construction can be had, the through traffic of the country must stop, the foreign commerce must be broken up, and all railroad companies must handle only local business, or such traffic as can be carried at local rates. Upon this assumption, I think, we are justified in giving this section such construction as will permit of the handling of through traffic.

Section 6 provides : "That in case any common carrier subject to the provisions of this act, shall do, cause to be done, or permit to be done, any act, matter or thing in this act prohibited or declared to be unlawful, or shall omit to do any act, matter or thing in this act required to be done, such common carrier shall be liable to the person or persons injured thereby for the full amount of damages sustained in consequence of any such violation of the provisions of this act, together with a reasonable counsel or attorney's fee," etc.

It will be noticed that this section provides as a penalty for doing what the act probibits or failing to do what the act enjoins, the payment of consequential damages to any party who can show he has been injured thereby. It matters not whether the act done or omitted to be done was willful or with the intent of violating the act. This section simply provides that in case the act is violated the penalty may follow.

The violation may consist in establishing a rate which the carrier deems "just and reasonable" and which even the Commission may have found to be "just and reasonable," and yet, if upon final adjudication by the court of last resort, or the verdict of a jury, such rate is found to be "unjust and unreasonable," it is, therefore, "unlawful and prohibited," and if a party can show that he sustained damage in consequence thereof, it matters not how remote the consequence, the jury will be instructed to find against the carrier.

There are other penalties provided in this act, which are for willful violation and which only apply after the law has been construed and the Commission or the court has decided what its exact meaning is. But this section has no such saving clause. Railroad companies have generally been free from "consequential" damages, but this section opens a very wide door and one that I fear will lead to a vast amount of litigation and great loss to railroad companies.

The company which I have the honor to represent is very badly situated with reference to the operation of this law. Its lines of railroad traverse four states, and nearly all of its traffic is inter-state traffic. Its main line extends from navigable water at Boston to navigable water on the Hudson River. It crosses navigable water at Hartford and intersects some eight or ten railroads which extend from its line to navigable waters parallel therewith, and it becomes of the greatest importance that no mistake should be made in the construction to be placed upon this act in establishing the tariff of rates for our lines. For this reason I may be excused if I have placed a harsh construction upon some of the provisions of the act, but it is such as it has seemed to me necessary to consider and take into the account, and I believe that upon reflection they will be found to be what the act actually calls for.

Contributions.

The Rotary Steam Snow Shovel.

OMAHA, Feb. 18, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE :

It may be of interest to know of the development of the rotary steam snow shovel since it first made its appearance in the West, when it was launched in the blockades on the Northern Iowa Division of the Chicago & Northwestern Railroad in Northern Iowa, in the early part of January, 1886. Up to that time the promotors of the shovel had never seen the hard snow customary to this Western country, and consequently the rotary shovel was constructed to work in the Eastern snow. Very little attention has been paid to the sharpening of the knives, the importance of which was plain to be seen in the very first of these hard frozen banks which it was called upon to work in, and up to that time it was the general opinion that one locomotive could handle it in any snow bank; but when the locomotive pushed it up to the first bank it was found that it could not hold it tight enough against the bank, to make it take even a shaving off the face of the bank. This brought to notice the fact that the knives had been sharpened on the outside, whereas they should have been sharpened on the inside. Another engine was added, with similar results. It was then discovered that the flanger had not been made rigid enough to stand the hard frozen snow, as every time it was dropped the little piston rod which raised and lowered it bent, and it had to be taken off. This alone was a serious loss in handling the rotary shovel in the terrible blizzards which prevailed at that time, and resulted in their having to put three locomotives on instead of one, and even then the rail and flange was in such a bad condition that three locomotives found it more than they could successfully manage in some places. Often, in order to keep from losing their power on the rail, they were obliged to go faster than the shovel was able to cut, and would bind the knife wheel so solid against the hard bank that her

engines could not keep the wheels turning, and when stopped from such a cause it was found with the last three or four turns of the rotary shovels there would not be sufficient centrifugal force to throw the snow out of the drum; but, as the knife wheel ran at the same rate of speed as the shovel wheel, and cut into the drum four feet of a snow bank ten feet deep and ten feet wide, every revolution until stopped would, in a case of overfeeding, cut and compress into the drum over twelve times as much snow as should be in at one time, making it a difficult matter to get the shovel started again. Another thing against the working of the shovel last winter was that, in order to prove that it could throw the snow out of any cutting, it was geared up to throw the snow eighty-five feet high, and four hundred feet from the track, all of which it successfully did; but it was found that such work was only as waste of power, as all that was required was to throw the snow out of the right of way. In fact, all the wants were brought to the surface during the blockades and noted; and notwithstanding all the defects, the rotary shovel made a wonderful record, considering the hard snow and severe storms of January, 1886. By the time the last blockade had been raised, Mr. E. Leslie, who has so successfully worked out and perfected the reversible knives and other improvements, was equal to the occasion, and with the aid of a competent engineer, had the drawings and specifications of the new knives ready, and through the kindness of the management of the C. & N. W. Ry., was enabled to have them put on temporarily at Eagle Grove and tested, to his satisfaction, before the snow had gone. As soon as this had been done, the rotary shovel was shipped back to the Cookes Locomotive Works at Paterson, N. J., where it was built, and during the summer had the temporary knives that were put on at Eagle Grove removed, and a new shovel wheel constructed with a knife for each shovel, making it one wheel only, dispensing with the big knife wheel, and also dispensing with the hollow shaft and two large gear wheels. As the new knives are automatic and right themselves as soon as they strike the snow, all the complications in the hubs of the knife and shovel wheel have been dispensed with. The power which was lost last winter with the friction of the hollow shaft and with the overhanging weight of the old knife wheel, which alone weighed several tons, was a serious loss of power, as was also the friction of the two gear wheels. This, together with the fact that the knife and shovel wheel had been geared up to run over one-third faster than the engines, made it very plain that the rotary shovel was working last winter at a very serious disadvantage.

This winter it has come out with all its alterations and improvements developed last winter, its engines being geared up to run one third faster than the shovel wheel, which has twelve automatic knives with only one shaft and two gear wheels, giving it all the power it was deprived of last year; and with the flanger and ice cutter in perfect working order, the result is that on a trial trip over the Oregon Short Line, where freight trains had been abandoned on account of the continued storms, the rotary steam snow shovel made the run from Granger to Pocatello, over two hundred miles, at the rate of twenty-five to thirty-five miles per hour, widening and cleaning out the cuts and flanging the track perfectly, removing all doubt as to its usefulness in ordinary snow, and proving, to the satisfaction of the officials of the Union Pacific Railway who had charge of the trial, how much quicker and more perfectly the track could be cleaned by the rotary steam snow shovel than by any other process, as well as the enormous saving in the cost of doing the work, say nothing of the loss of traffic, etc.

On the evening of the 6th inst., the rotary steam snow shovel made its final trial trip over the Wood River Branch of the Oregon Short Line, from Shoshone to Ketchum, a distance of about seventy miles, with a grade of one hundred and ninety feet to the mile. A special train was made up at Shoshone, consisting of the rotary steam snow shovel and one locomotive (a ten-wheeler) with one coach and Asst. Gen. Supt. E. Dickenson's official car, on which was a speed recorder which registered the exact speed made on the trip. Mr. Dickenson and other Union Pacific officials watched closely the working of the rotary plough (as they called it) and also the working of the flanger, while I guided the engineer of the locomotive which furnished the motive power. This being the first heavy work the rotary plough had been put into since the alterations above referred to had been made, the same care was taken in the first two or three heavy cuts that had been taken last winter, namely, approaching them at a very low rate of speed. The first cut it got into proved that it was not being fed fast enough; the next bank was struck at a rate of about ten miles an hour, and, notwithstanding there was over three feet of snow on the rail, it was readily noticed that the speed was still slow. The next heavy bank was struck at the rate of over twenty miles per hour; and over the last thirty miles, where the snow was not less than two feet on the level, and from three to five feet in the cuts, and the flanges were filled with ice, the time made was over twenty miles per hour, without having to slow up for the heavy banks, and the rotary shovel threw a steady stream of snow out over the telegraph wires, averaging about 150 ft. from the track, making a grand sight. The flanger cut the ice out of the flanges, making a perfectly clean flange and rail, and leaving the Wood River Branch open for heavy traffic once more. The rotary steam snow shovel on this trip made a record of from 20 to 30 miles per hour, with only one locomotive, on a heavy grade and in snow in which it could not have made more than 3 to 5 miles per hour last winter with three locomotives.

The result of the trials which the Union Pacific Railway has given the rotary steam snow shovel is to prove, to their satisfaction, its complete success, and that it is as superior to the best push plough ever used as the planer is to the cold chisel, hammer and file in the machine shop; and that it will completely revolutionize railroading in this country.

J. S. LESLIE.

STATEMENT OF COST OF REPAIRS BY SECTION LABOR—SUPPLIES, ETC.

SECTION.	Miles counted as single track including sidings.	Cost repairing fences, road crossings and signs.	Renewal of ties, placing in track.			Misc. report road and track by sec. gang and extra track forces.		Total expense by section labor including inspection.	Oil supplies and tools.	All the material except rails, frogs and switches.
			No. of ties.	Cost per tie.	Total cost.	Average cost per mile.	Total cost.			
1..... ...	12.04	13.49	1,618	.065	104.77	241.71	2,910.29	4,539.14	63 98	31.91
2.....	8.70	31.09	1,501	.103	154.49	470 48	4,094.27	5,367.57	40.12	18.40
3	9.00	29 65	2,020	.1 4	250.80	418.89	3,770 08	5.410.52	33.65	16 35
4..... ...	9.54	11.87	1.7 9	.086	149.30	278 09	2,652.97	4,218.35	42.25	17.25
5	8.30	6.82	1 648	.080	133 20	3?0.86	2,912.20	4,130.59	40.12	27 05
6.	8.03	33 73	709	.086	61.04	26 .82	2.905.47	4,257.73	53.96	43.50
7.	9.42	55.70	1.474	.062	91 25	282.88	2,476.40	3,614 68	29 32	30 00
8	6.63	11 31	2,045	.C9	2 4.14	598.33	3.966.97	5.570 83	168 78	121.52
9.	6.4?	13.04	1,439	.107	154.44	780.75	4.996.83	6,289.09	176 17	85 00
10.....	21 10	122.20	2,817	.124	350.75	326.77	6,895.00	8,74e 79	211.04	109.79
11.....	13.73	107.79	3,424	.095	3 6 08	243 38	3,171.32	6,410.80	56.53	24.75
Totals...	112 19	436.69	20,424	.096	1 980.86	363.23	40,751.80	58,594.99	915.92	531 52

Inspection of Track. Troy & Greenfield Railroad.

HOOSAC TUNNEL, Mass., Feb. 8, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Herewith copy of the award of premium for best section of track on the Troy & Greenfield for the railroad year 1886 also copy of table of expenses used in ascertaining the most meritorious foreman.

The Troy & Greenfield is now the Tunnel Division of the Fitchburg. John McManama continues in his old position for the Fitchburg on the Tunnel Division.

The foreman awarded the prize for 1886 also received one in 1884. Respectfully yours, TRACK BOLT.

TROY & GREENFIELD RAILROAD AND HOOSAC TUNNEL,
OFFICE OF ENGINEER M. OF WAY,
NORTH ADAMS, Jan. 1, 1887.

John McManama, Supervisor of Track:

DEAR SIR: A premium of $25, to be given to the section foreman showing the best record and results during the year ending Sept. 30, 1886, is hereby awarded to W. J. Byrnes, Foreman of Section No. 7. In making this award the expense incurred, the condition of track as to line, surface, etc., condition of road bed, fences and station grounds, promptness in execution of special orders and vigilance in the observation of rules and regulations have been the main points considered.

Martin Welsh, Foreman of Section No. 1 may be also mentioned as showing good results at moderate cost.

It is a subject for congratulation that there has been on no part of the road any accident to any train that can be attributed to any fault of track or of track appliances; and no exception can be made to the general zeal and commendable industry of all connected with the department.

F. B. LOCKE, Eng'r M. of Way.

Improvement of the Canals.

NEW YORK, Feb. 16, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I desire to call your attention to the enclosed statistics and the important lesson which they teach. They seem to me to establish beyond question the vast importance to the continued prosperity of the state of New York of maintaining and improving to the highest state of efficiency the canals of our state. It is clear that if the freights delivered by our canals to the port of New York during the canal season were subtracted from the total deliveries to that port, less than one-half of this great volume of business which supports the prosperity of our state would remain to us. Nor is this all. But for the influence of the canals in keeping freights down to a reasonable limit, the cost of transportation by railways would be so advanced—at least 25 per cent.—as to send to other ports nearer by railway to the fields of production than New York, and through such other ports to the outside world, the large majority of the freights and business now done through our state as the highway of commerce. Any use of these statistics which you may be able and willing to make in the interest of the improvement of the canals, and especially by throwing your justly great influence in favor of the bill now pending in the Legislature for an appropriation to continue the improvement of the canals, will be highly appreciated by the friends of the canals throughout the State.

O. B. POTTER,
Chairman Union for Improvement of the Canals

At the regular monthly meeting of the New York Board of Trade and Transportation, held Feb. 9, 1887, the following statistics were presented by the Committee on Canal Transportation and ordered printed.

"Showing what the canals of the state are doing to preserve our commerce, to furnish the necessaries of life cheaply to our citizens, to supply cheap material to our manufacturers and to build up the interests upon which the great wealth and population of our state depends. Large manufacturing industries mean populous communities and a home market for the products of our farms and fields, with increased wealth to all our citizens. Increased wealth in one part of a state means greater ability to pay taxes and a decreased burden of taxation upon other sections.

1886—*Receipts of grain at New York during seven months of navigation viz., May to November, inclusive.*

Canal.	Rail.	River and coastwise.	Total.
43,619,355 bush.	31,986,766 bush.	765,116 bush.	76,371,237 bush.

The above figures show that during the season of navigation in 1886 the canals delivered at New York 11,632,589 bushels of grain more than the railroads, and 10,867,473 bushels more than was received by all other routes combined.

Total receipts during seven months of navigation for years 1884, 1885, 1886.

Canal.	Rail.	River, coastwise, etc.	Total.
110,550,458 bus.	92,440,154 bus.	3,555,621 bus.	206,546,233 bus.

These figures prove that the canal alone brought 14,554,683 bushels of grain more than all other routes to New York for the above period. In other words, the canal brought during the season of navigation 7,277,342 bushels more than half of the aggregate amount received.

Comparison of the receipts of grain, in bushels, for the entire years 1885 *and* 1886.

	Rail.	River, coastwise, etc.	Canal.
1885	67,563,023	2,929,656	29,926 879
1886.....	59,200,235	1,204,039	43.995,855
Increase or decrease in 1886	D. 6,362.788	D. 1,725,617	I. 14,068,976

The above figures show that while receipts by all other routes fell off largely, those by canal were greatly increased, thereby saving to New York millions of bushels which would possibly have gone elsewhere, because of lower rates by rail. In other words, the grain business of New York for 1886, were it not for the canal, would have run several millions bushels behind the year 1885.

Receipts of grain for 1886, *in bushels, at*

Philadelphia.	Baltimore.	Boston.	3 ports combined.	New York.	
17,236,078	29,360,141	19,861,826	66,458,045	Canal....	43,495,855
				Rail	59,200,235
				Coastwi'e etc.....	1,204,039
					104,400,129

This table shows that the receipts at New York *by canal* exceed the *aggregate* receipts of Philadelphia & Boston for the entire year, and are only 22,462,190 bushels less in seven months than the *total* amount received at the *three* ports combined for twelve months.

The aggregate receipts at New York exceed the combined receipts of Philadelphia, Baltimore and Boston by 37,942,084 bushels, while without the canal receipts New York would be behind 12,053,771 bushels.

Receipts of grain, in bushels, at competing ports during season of navigation compared with receipts when navigation is closed.

Navigation.	Philadelphia.	Baltimore.	Boston.	3 ports combined.	New York.
Open.. ..	11.554,663	16.822 309	11 958,418	40,335,390	76,371,237
Closed....	5.681,415	12,537,832	7,913,408	26,122,655	28,182,892

A glance at the above figures will show that while the canals are open and directing the channels of trade toward New York, that city is the centre of the grain trade; when they are closed the competing ports more than hold their own.

Safety from Derailment by Three-Truck Cars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The White River disaster is said to have been caused by a broken axle of a six-wheel Pullman truck with three axles grouped in each truck, with much lateral end play to centre axle, and carrying the enormous weight of these coaches constantly plunging and pounding on the axles grouped at each end of coach. It seems to me this disaster should cause our railroad officials to seriously consider whether to use two trucks with three axles in each truck or three trucks with two axles in each and with one of the three trucks acting as a centre support truck. Would not the centre support truck car be a safer arrangement to carry and resist the pounding and ponderous weight of these coaches, the weight being distributed over three instead of two trucks. From my observations of the workings of the centre support or three-truck cars on roads that had them, two-truck cars left the track and were badly wrecked, while the centre support cars in same train, on account of their centre trucks partially carrying the weight of car and acting as a centre guide to the car, passed over in safety the space left by the broken rail, the two truck cars following being also derailed. Hence I conclude that a long coach with a centre support truck having the proper adjustment of springs for weight and vibration of coach is the safest as well as the easiest on the track of either system of trucks. It seems to me that some company using these coaches, in view of the White River disaster, ought to test the value of the centre support truck system under their long cars (when permission free of royalty will be given for a limited number of coaches if asked for).

In your paper of July 11, 1884, you illustrated my centre support truck as applied to a freight car. The same appliances can be used on an ordinary coach truck with slight modifications. Yours truly,

L. FINLAY, Malvern, Ark.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Some of our contemporaries of the daily and technical press seem to think that because the railroad managers of the country are not preparing to take vengeance on Congress by playing all the mischief they can with rates and fares, therefore they are well pleased and believe the late railroad legislation to be about right. The behavior of these gentlemen is on the contrary merely a proof of their wisdom and sober-mindedness as a body. Instead of tearing their hair and leaving the course of events to be determined by chance, they are engaged in an earnest effort to find out, first, exactly what the effect of the bill is in changing their present manner of doing business, and secondly, what steps must be taken to make this change as innocuous as possible.

If it should prove that the long and short haul clauses of the bill do not practically affect railroad rates it would not show the harmlessness of the bill.

It has probably already caused indefinite disturbance by delaying contracts which would have been consummated but for the alarm exerted by it, and this very fact carries with it consequences to the business of the country which may not express themselves on the trade statistics of the year on account of other disturbing influences, but which are none the less disastrous.

The interesting grain movement statistics with Mr. Potter's letter this week's will be read with interest by every one who follows the course of this traffic and its division between the railroads and canals. Whatever opinions may be held as to the ability of the canals to control railroad rates at any given time, there can be no question of the desirability of maintaining these great highways in first-class order. Even if they are temporarily controlled by some combination of boat owners, they offer a much better field for competition than the railroads can, and must have a steadying effect on rates in the long run.

Competition on railroads, so far as rates are concerned, must necessarily be of the spasmodic and violent kind which generally results where the business is divided among a few great competitors. Competition between such, so far as advantage to the public goes, can only be in *quality* of service such as is obtained under a good pool system. The competition in rates between such rivals is ruinous to business from the enormous fluctuations which may be brought about between two days.

The rate competition on canals cannot be effected in such a disciplined manner, and the fluctuations, where not due to changes in the volume of business, must take place more gradually.

Commissioner Fink's letter to the Chicago *Tribune*, which we give in another column, although very properly denying any intention to nullify the law, practically states the case as stated in his former communication about the long and short haul classes. This is, that these clauses liberally interpreted as not being intended to seriously disturb the whole business of the country, do not place any restrictions on rates except so far as they discriminate between man and man engaged in the same line of business, under the same conditions, or shortly stated, so far as the rates are the result of favoritism and not of the economical interests of the railroads.

PUBLIC RIGHTS IN LABOR DISPUTES.

While there has been no single strike this year so widespread as the Missouri-Pacific strike of 1886, and none which so distinctly affected railroad operations in the narrower sense, the same questions have been brought home to every man by the street car strikes in Boston and San Francisco, and by the freight handlers' strike in New York City. Each of these emphasizes the peculiar position of common carriers in the modern industrial world. Each shows to what straits the organized action of a body of workingmen may reduce the population of a whole city; and each shows a weak point in our present industrial organization. The business of a common carrier is, to some extent, a monopoly—often to a very great extent. This has gradually come to be recognized by all parties. The decision of the Supreme Court in the Granger cases, that the government has the right to control carriers' charges, was based on this ground; and it has stood practically unchallenged, because the ground taken was so thoroughly consistent with the facts.

Now, the same set of facts which gives the state the right to regulate charges gives it the right to compel the companies to perform their services. It is not settled exactly under what circumstances this compulsion will be exercised. The New York freight handlers' strike of 1882 gave rise to a series of decisions which can hardly be said to have settled anything very definitely. But the existence of some such right is a business necessity, grounded in facts more unanswerable than the decision of any court. If the community must have certain services it cannot leave it to the decision of the individual company whether it will perform those services or not.

But if we admit, in an unqualified fashion, the right of the community to compel the corporation to perform these services, we are at once involved in another difficulty. If the services must be performed at once, we give those employés who may happen to be in the service of the company for the time being, a right to dictate their own terms, if they have but a reasonably compact organization. Almost no company which handles freight or passengers in any shape is so situated that it can at once fill the places of an organized body of strikers. To say, without qualification, that the company must serve the public without delay is to give its employés a power to dictate the terms of their remuneration.

We are thus face to face with an alternative where both answers are unsatisfactory. Deny the duty of the company to do its work promptly at all times, and you place the public at its mercy. Assert such a duty, and you place it at the mercy of the employés. Some sort of a compromise is necessary, but it is by no means clear exactly what.

Some persons hope to see such disputes systematically settled by arbitration. But arbitration in the future must be a very different thing from what it has been in the past, if it is to accomplish what these people expect of it. Of all the quack remedies for labor disputes, says a New York daily, the greatest is arbitration, and it must be confessed that there are many facts to support this view of the case.

The award of arbitrators in a labor dispute has this great disadvantage: That it is almost never enforceable against the employés, and sometimes not against the company. It differs from an ordinary judgment, in settling a series of relations which lie almost wholly in the future instead of in the past. New circumstances may arise which were not foreseen at the time of the settlement. They may arise at once, and either party may think itself justified in refusing to abide by the decree. If they refuse to abide by it, the whole dispute begins over again, and has to be fought out over again. In such a case, arbitration is not merely, no remedy, but worse than none, for it invites the contestants to raise points by an apparent chance of easy settlement, which really does no good.

Or if, as sometimes happens, matters are definite enough to enforce the award permanently against the company, it is often impossible to enforce it against the employees. It is difficult to say whom or what to hold responsible in case they refuse to abide by it. It thus becomes a one-sided solution of the difficulty. If the law makes it optional, the employer will not consent to resort to it; if it is made compulsory, it is a one-sided compulsion which may readily give the employees a power without a corresponding responsibility.

The difficulty is by no means confined to our own country. A writer in the *Moniteur des Intérêts Matériels* (of Brussels) makes the radical proposal that the terms of the contract between employer and employé should be much more definitely limited by law than they are at present. He says that, under the existing system, the rights of the two parties are so ill-defined that no one can tell in advance what they are; that where, as a result of any dispute, they are arranged by special agreement, the rights are generally all put on one side and the responsibilities on the other, according as one or the other party may happen to be the stronger; and that, finally, there is in the majority of cases no available means of compelling the offending party to do his duty by the other party and by the public. He says, with a great deal of reason, that where the harm involved in a labor dispute becomes a public calamity, the terms of the agreement ought not to be regarded as mere matters of private contract, to be varied or omitted at the discretion of the parties themselves; but that there should be such laws as to their rights and duties that any violation of the labor contract should be not merely a breach of private right, but a public wrong, and be treated as such. In this way, he says, we could provide not merely for circumstances which are foreseen in the contract, but for those which are not foreseen; and could secure the public from an interruption of its business, without placing either laborer or capitalist at the mercy of the other.

Now, these proposals would be very difficult to carry out. It would be almost impossible to put a laborer in prison, or to adopt any similar remedy, because he did not do the work which he was bound to. But in spite of these practical difficulties they contain an important truth. There are signs that our own law—by the decisions of the courts quite as much as by statutory enactments—is working in this direction. A recent decision in an inferior court in Connecticut makes blacklisting illegal, and visits a fine upon the parties who were privy to it. On both sides the definition of "conspiracy" is becoming clearer, and the remedies against it more severe, as it becomes recognized that there is a public danger in connection with it. The matter of employers' liability in cases of accident is becoming more clearly defined by law, although the United States has much to learn from England in this particular. In several States the manner of payment of wages can be no longer made the subject of unrestricted agreement. Perhaps these are indications of the general direction which law and legislation is likely to take. It may be that instead of widening the field for special agreement by arbitration, we shall see it restricted; that instead of new means for private arrangement between the parties, we shall have new definitions of the *public* rights and responsibilities of employer and employé. It may be that twenty years hence we shall see the labor contract so much regulated by general laws, that the employés will not have the power to bring unforeseen pressure to bear upon the companies, and that the companies will have no excuse in case a failure to agree with their employés makes the public suffer.

PREMIUMS FOR GOOD WORK ON RAILROADS.

From the table given in another column it appears that the Troy & Greenfield Railroad section, presumed to be best, was also the cheapest, which, of course, is not always the case; indeed, the Pennsylvania formerly awarded its premiums for best track solely on the condition of the same without regard to expense. A proper combination of the two, as aimed at on the Troy & Greenfield, would be the true plan, and accounts of the methods in use on roads where premiums are given would be very welcome.

There can be little doubt of the desirability of such premiums. They tend to solve the problem of how to make the workman take an interest both in the quality and in the economy of his work. Under the present plan a foreman, or indeed pretty much every employé of a great railroad, only finds out when he does wrong. The reproof comes quickly enough. But he never knows whether his work compares favorably with his fellows, unless through promotion, and promotion cannot come to every one for lack of vacancies.

The president of a great railroad once said: "Any one on this road can become president of it." The fallacy is obvious. There are not likely to be more than a dozen presidents in the period of service of the oldest employé on the road. There were ten or twelve thousand employés. Grant that fifty of them might possibly have the stuff in them to be president. Only one-fourth of them could attain the office, and then only after fortunate combinations of circumstances had enabled them to get ahead of their competitors in the grades below, which a much larger number of their fellow-workers would be able to fill.

If then the trackman has a spark of ambition in him,

it is apt to smoulder out between the want of appreciation which special excellence meets with, and the wretched and constantly changing hands that the company's penny-wise system of wages allows him.

How can a foreman do good work when he cannot even reprove a man for slackness, because the man only puts up with the wages he gets on condition that he is allowed to do half work? A really good section can only be made by a well disciplined force, each man of which knows his duty and does it. How can such a force be kept up under a system which pays the lowest wages which the dregs of the labor market will take, and which, when it keeps the best men of a gang over dull times, keeps them on wages proportional to the dullness? It sometimes seems as if railroad corporations not only had no souls, but no reason in this matter. If a private individual has a lot of good men in his employ, he keeps them, if possible, over dull times at some sacrifice to himself. If a manufacturer he tries to find standard articles of manufacture to keep his force busy when orders are dull, or he puts his men on repairs to his stock or buildings. He has faith that times will be better, and he wants good men to do the work and the plant to do it. Furthermore, when he sees a man putting brains into his work, he gives him an approving word. Perhaps he goes further, and builds comfortable houses for his men, and encourages them to have families and become fixtures. He even, in many cases, goes so far as to give men an interest in his profits; founds benevolent societies for their benefit, of which they only have the advantage when they stay a long time with him. He carries on his business with no profit at all in very dull times, mainly, perhaps, to keep the trade and to keep his machinery in order, but partly to hold his own trained force.

Now let us see how a great railroad company conducts *its* labor department. It pays in most cases the lowest wages for which the men can be got to work at all. When a dull time comes it discharges all the men it can possibly do without, even if it has to let its structures, roadbed and rolling stock run down in so doing, and it decreases its wages still more, as the scarcity of work in general enables it to do, and only the laziest and least enterprising men stay with it, except in a few cases where the men have families to support. These are, however, rare, as comparatively few such men take service with a railroad. All of this, too, in spite of the fact that the dull time leaves the track clear for work and for construction trains; cars and engines are available for overhauling in the shop; and wages for even good men are very low.

Presently business revives. Trains multiply on the track. Road bed and bridges call for attention after that long neglect. Cars and engines are wanted on the road, but have to go into the shop instead to make them fit for service.

More crews are needed for the numerous sections of freight trains. Orders are given to get the train hands somehow, and master mechanics are "punched up" for power and rolling stock. Presently the crop of new hands begins to bear fruit in rear-end collisions, misplaced switches, etc., and the overworked track and bridges remonstrate against longer neglect. The word is given to take on men in all maintenance departments, and put on as many construction engines as can possibly be spared from the motive power.

More collisions—with the construction trains let loose on the crowded track. The construction gangs lie on side tracks for hours at a time, waiting for a chance to pull out to work, and when they do work, the men feel that they have the whip hand and are independent.

It is certainly practicable to find out what sum per annum is desirable to expend for repairs and renewals, and to put this into a fund which may accumulate in busy years, when track and rolling stock are in active demand, and be drawn from for repairs and renewals during dull years. This would have the double advantage of doing the repairs at the best time for doing them, and of keeping the operating and maintenance force more uniform than at present.

FIRE EXTINGUISHERS ON LOCOMOTIVES

Fire extinguishing apparatus on a locomotive can often be utilized in extinguishing fires in trains or at small stations or freight houses. Whether, however, a fire-pump on the engine would have saved many lives at either the Rio, the Republic, or the White River disaster is somewhat problematical.

A little reflection will show our correspondent, N. T. & Q., that the locomotive is generally somewhat injured in a collision or derailment, and when this is not the case, as at White River, the engine is often unable to get near the burning cars in time to be of much assistance. It is of course possible that at White River, the locomotive, if fitted with a good fire extinguishing pump or injector, might have extinguished the fire on the bridge and then backed over the bridge and played upon the burning cars below the bridge. But, to say the least, this is problematical. The proper remedy for the loss of life at White River lies in the direction of prevention rather than cure. Good rails, plenty of ballast, efficient guard rails, a safe system of car heating, and the use of one of the numerous forms of gas or electric lighting instead of the dangerous and fire-scattering lamp would have effectually robbed the White River accident of its horrors.

The subject of fire extinguishing apparatus on locomotives has, however, attracted considerable attention among railroad men, both here and abroad, and many prominent lines have many of their locomotives equipped with some special fittings for fire purposes. The Pittsburgh, Cincinnati & St. Louis use a Van Dusen & Tifft injector on their switching engines, in order to extinguish any fire that may start in the yard or among the cars being shifted. The New York Central place a force pump on the boiler near the smokebox. The Union Pacific locate the force pump near the pilot, while the Pennsylvania place a Korting fire injector on the sloping back of the tank of their shifting engines. This injector is specially designed to throw a solid body of water (which is very essential in order to extinguish a fire), and is fitted with a suction connection so that water can be obtained from the city mains. Many of the German lines apply fire extinguishing apparatus to their locomotives, and the London & Northwestern, of England, have for many years fitted a fire-branch to one of the two Webb injectors which each locomotive carries. A short length of hose is fitted to this fire-branch, and in dry weather it is used continually to wet the coal on the tender.

In all these cases, however, the main idea has been to provide a means of extinguishing a fire in a freight train or building adjoining the railroad. Such fires are very frequent, are produced by ordinary causes, and seldom result in loss of life. They are, however, very destructive to property and often cause annoying delays to the working of the road. The three fires at Rio, Republic and White River have cost fully sixty and possibly nearly eighty lives, and were produced by totally different causes. At Rio and White River derailment, and at Republic collision preceded the fire, and were only too likely to have rendered unavailable or materially injured any fire extinguishing apparatus on the engine.

It is, however, necessary to bear in mind that while it will not do to expect a fire pump or injector on the engine to save life in the event of passenger cars taking fire, it by no means follows that such an appliance would be entirely useless. It would in many cases render good service, and it is difficult to imagine a case in which it could do harm. The lives of passengers should, however, be guarded by other methods—those of prevention rather than those of cure.

Northwestern Grain Movement.

The Northwestern grain receipts in January were about 50 per cent. greater than the receipts for the same month last year, but were about 12 per cent. less than the receipts in January, 1885.

The receipts for the six successive weeks ending with Feb 12, and for the corresponding weeks of 1885 and 1886, have been in bushels:

	1887.	1886.	1885.
Jan. 8	5,072,877	2,802,330	4,335,705
Jan. 15	4,142,899	1,873,265	4,786,075
Jan. 22	3,822,148	2,988,850	5,694,552
Jan. 29	4,050,390	3,724,825	4,612,153
Feb. 5	3,621,542	4,093,948	5,625,383
Feb. 12	2,098,630	5,071,609	7,364,601
Total	23,808,476	20,554,833	32,416,869

The receipts at these ports from July 24, 1886 (the beginning of the crop year), to Feb. 12, 1887, as compared with the previous three years, have been, in *thousands* of bushels:

	1886-87.	1885-86.	1884-85.	1883-84
Wheat	64,412	43 648	81,227	55,686
Corn	52.528	53.415	55,041	68,664
Oats	39,705	35,813	35,910	37,857
Barley	16,866	15,486	12 371	13,595
Rye	1,459	2,250	3,653	5,737
Total	174,970	150,621	188,202	181,539

While the total receipts this year are 16 per cent. more than for the same time last year, they are less than the receipts of either of the two previous years. The greatest differences in the receipts of the various years are in those of wheat. There was no very great difference between the corn receipts this year and for the same periods in the two previous years, but the receipts in 1883-4 were about 30 per cent. larger than those of this year. The receipts of oats have not varied over 10 per cent.; though, so far this year the receipts are slightly larger than either of the other years

January Exports.

The exports of breadstuffs in January were about 54 per cent. larger than in January, 1886. The value of the exports during January has been as follows during the last seven years:

1881	$14,929,406	1885	$17,872,413
1882	11,977,524	1886	9,407,315
1883	15,835,077	1887	14,528,809
1884	12,285,026		

Thus, while the value of the exports this year was more than half as large again as that of last year's exports, it was only about the average value of the January exports for the last seven years.

The *quantities* exported in January of each year have been, in bushels:

	Flour.	Wheat.	Corn.	All grain and flour.
1881	3,372,484	8,220,390	3.010,884	14.885,376
1882	2,172,289	6.772,511	1,659,579	10,808,562
1883	4,209,687	7,005.296	4,170.706	15.508.781
1884	3,823,497	5,040,889	2,543,502	11.797.603
1885	5,085,229	10,402,190	6,918,050	22,855,251
1886	2.656,831	4,018,808	6,074 432	13,074,703
1887	4,826,597	8,056,661	4,181,124	17,245,433

The flour exports were larger in January than they were during the same month of any previous year, except in 1885, when they were about 260,000 barrels more than they were last month. The wheat exports last month were about double those of January, 1886; but it must be remembered that the January exports in 1886 were smaller than those of any other year since 1877. As compared with previous years, the wheat exports last month were about 23 per cent. less than those of the same month in 1885; though greater than the exports during January of any previous year since 1881.

Expressed in *thousands* of bushels, the aggregate flour and wheat exports in January have been during the last ten years:

1878	6,840	1883	11.215
1879	8,205	1884	8,864
1880	7,808	1885	15,487
1881	11,593	1886	6,676
1882	8,945	1887	12,883

It will be noted that not only were the exports of wheat and its product last month about double those of the same month in 1886, but they were greater than the January exports for any previous year, except 1885. The *quantity* of grain of all kinds (including flour) exported last month has only been exceeded once in the same month of either of the last seven years. That was in January, 1885, when the exports was 22,800,000 bushels, as against 17,200,000 bushels last month.

For the seven months ending with January the value of the breadstuff exports has been:

Year.		Year.	
1880-81	$168,509,580	1884-85	$97,572,920
1881-82	124,121,439	1885-86	62,406,047
1882-83	133,658,133	1886-87	92,789,263
1883-84	100,299,652		

Expressed in per cents. the value of the exports this year is 49 per cent. greater than last year; but 5 per cent. less than in 1884-85, 31 per cent. less than in 1882-83, and 45 per cent. less than in 1880-81.

The quantities of the various articles exported during the last seven months, as compared with those for the same period last year, are as follows, in bushels:

	1886-87.	1885-86.
Flour and meal	30 458,151	21.209,172
Wheat	59.642,225	24,528,230
Corn	21,238,694	30.379.839
Oats	282,289	5,176.097
Barley	1,148,957	155,019
Rye	85,080	128,950
Total	112.855,396	81,577,467

The flour exports this year were about 44 per cent. more than the exports for the same period last year, and the wheat exports were 143 per cent. greater. The corn exports were, however, about 30 per cent. less than last year. It may be said that there have been practically no exports of oats, as there were only 282,000 bushels exported this year, against 5,176,000 bushels last year. There has been quite a foreign demand for barley this year, as is shown by the fact that there have been 1,100,000 bushels exported this year, while for the same period last year there were only 155,600 bushels shipped.

The exports of breadstuffs from the various ports have been as follows, expressed in values:

	January. 1887. Value.	Per ct.	January. 1886. Value.	Per ct.
New York	$5,365,649	37.0	$3,252,954	34.6
Boston	818,756	5.6	976.349	10.4
Philadelphia	1,352.846	9.3	298,811	3.2
Baltimore	3,261.394	22.5	1,565.248	16.6
New Orleans	517,024	3.5	401,063	4.3
San Francisco and Willamette	2,767,174	19.0	2,637,682	28.0
Other ports	445,966	3.1	275,208	2.9
Total	$14,528,809	100.0	$9,407,315	100.0

	For the 7 months. 1886-87. Value.	Per ct.	1885-86. Value.	Per ct.
New York	$32,142,473	34.6	$25,462,870	40.8
Boston	8,795,982	9.5	7,141,698	11.4
Philadelphia	6,703,656	7.2	3,605,786	5.8
Baltimore	17.032,459	18 4	6,683,638	10 7
New Orleans	2,724,322	2.9	1,771,057	2.9
San Francisco and Willamette	19,463,388	21.0	13,326,184	21.4
Other ports	5,926,983	6.4	4.353,695	7 0
Total	$92,789,263	100.0	$62,356,128	100.0

The increase and decrease in percentages in the seven months of 1886-87 over the same period of the previous year was:

	Increase. Per cent.	Decrease. Per cent.
New York	....	6 2
Boston	....	1.9
Philadelphia	1.4	....
Baltimore	7.7	....
San Francisco and Willamette	....	0.4
Other ports	....	0.6
Total	9.1	9.1

New Orleans' per cent. was the same both years.

The provision exports, including beef, pork and dairy products, in January were about 22 per cent. greater in value

han the exports for the same month last year. The values of the January exports for the last six years have been:

Year.		Year.	
1882	$13,200,379	1885	$11,965,978
1883	10,978,825	1886	6 671.597
1884	9,091,877	1887	8,131,442

While the exports last month were greater than for the corresponding month last year, they were less than the January exports of any other year given above, being 32 per cent. less than in 1885 and 38 per cent. less than in 1882. The exports of pork products in January during the last ten years have been, in *millions* of pounds:

1878	125.2	1883	84.0
1879	126 1	1884	65.7
1880	92 0	1885	109 3
1881	144 5	1886	70.7
1882	104.0	1887	87.5

Thus it will be seen that the exports this year were less than for any of the other years except 1883, 1884 and 1886. The fresh beef exports were a trifle more than last year, but considerably less than in January, 1885.

The January exports of salt beef were 3,594,567 lbs. this year, as against 2,672,399 lbs. in the corresponding month of last year, and were about the same as in January, 1885. The January exports of cheese were only 1,923,037 lbs. this year, while in 1886 they were 3,209,287 lbs., a decrease of 40 per cent. There was also a great decrease in the exports of butter, the amount this year being 697,070 lbs., and in 1886, 1,010,974 lbs., a decrease of about 30 per cent.

For the three months ending with January, the exports of beef and pork products have been as follows, expressed in values:

	1886-87.	1885-86.		Inc. or Dec.	P.c.
Beef products:					
Canned	$927,878	$807,053	I.	$120,825	14.8
Fresh	1,878,930	2,366,166	D.	487,236	20.6
Salted	568.718	635,753	D.	67,035	10.5
Tallow	696,013	369,313	I.	326,700	88 5
Total	$4,071,539	$4,178,285	D.	$106,746	2.6
Pork products:					
Bacon	$8,778,734	$8,424,896	I.	$353,838	4.2
Ham	1,753.947	1,241,776	I.	512,171	41.2
Pork	1,428.669	1,312,463	I.	116,206	8.9
Lard	7,407.666	4,981,093	I.	2,426,573	48 7
Total	$19 369,016	$15,960,228		$3,408,788	21.4

The value of the exports of cotton in January was about $8,500,000 greater this year than in 1886. The exports of mineral oils were about 10 per cent. greater in quantity last month than in January, 1886, but about the same in value in both years.

The aggregate values of the January exports of the commodities named in the last two years have been:

	1887.	1886.
Grain products	$14,528,809	$9,407,315
Beef, pork and dairy products	8,131,442	6,668.814
Mineral oils	3.759,237	3,687,089
Cotton	31 559,465	23,072,118
Total	$57,978,953	$42,835,336

This shows an increase in value last month over January, 1886, of $15,143,617, or 35 per cent. The value of the exports of these articles in January, 1885, was about $3,000,000 more than last month, and in corresponding month in 1884 about $1,500,000 less.

West-bound Through Freight.

The trunk line through freight traffic, west bound, from the seaboard to and beyond the trunk line western termini (Buffalo, Toronto, Pittsburgh, Wheeling, etc.) in January was 158,112 tons. This includes the shipments from New York, Philadelphia, Baltimore, Boston and what is known as the interior New England points. These interior points are Lowell, Nashua, Worcester, Springfield, Providence, South Framingham, Northampton, Holyoke, Westfield, Salem and Fitchburg.

The west-bound shipments from New York city in January amounted to 94,165 tons; and for the last 10 years the January shipments from New York city have been, in tons:

1878	44,445	1883	89.112
1879	50,395	1884	93.293
1880	83,819	1885	80.761
1881	75,261	1886	81.120
1882	106,344	1887	94.165

The January shipments this year were, therefore, larger than those of any other year in the decade, except 1882, when they were about 13 per cent. larger than they were last January. In 1884, however, the traffic reported for the trunk lines was nearly as much as it was for last month; but at that time the Lehigh Valley was not a competitor for through traffic from New York. If the shipments of the Lehigh Valley were included the total shipments last month would have probably slightly exceeded 100,000 tons. A comparison of the January shipments on this basis, would show an increase of about 8 per cent. last month over January, 1884, and a decrease of only 6 per cent. as compared with the traffic of the corresponding month in 1882. It must also be borne in mind, that in January, 1882, the rates were extremely low, as is shown by the fact that on Jan. 16, 1882, the rates were restored to the basis of 30 cents on 1st class and 15 cents on 4th class, New York to Chicago. On Jan. 23, 1882, the tariff was advanced to the basis of 45 cents on 1st class, but it was understood that the roads would carry out the large number of contracts which were in effect, many of which did not expire until July 1 of that year. Under this condition of affairs it is not strange that the traffic was exceptionally large, though without much, if any, profit to the carrier.

While probably nobody will claim that the tariff rates were strictly maintained last month, it can hardly be said that there was general demoralization. The stronger lines probably got nearly tariff rates, if not full tariff; but the other roads undoubtedly made greater or less concessions as circumstances appeared to require. However, this appears to be about as near an absolute maintenance of rates as can be reached under the existing conditions, and it would seem that there can be no question but that the business last month was a fairly remunerative one. It is proper to state that much the greater portion of the increase in the total January business was in low-class freights. The shipments of old rails, scrap, blooms, etc., were very large in January, as was the case in November and December. There was also an increase in the high-class freights as compared with the same month in 1886. This would indicate that the western consumers are purchasing manufactured articles more freely than they were at this time last year.

The shipments from Boston, Philadelphia and Baltimore were much larger than they were in January, 1886. The January shipments from these points in the last eight years have been in tons:

1880	73,847	1884	51.221
1881	47,302	1885	42,883
1882	59 258	1886	44.582
1883	46,403	1887	56,447

Thus the shipments from these points were about 27 per cent. more in January last than they were in the same month last year; and they have not been exceeded by the January shipments of any year, except in 1880 and 1882.

The aggregate shipments from the four seaboard cities and the interior New England points during January have been in tons:

1880	165,310	1884	152.194
1881	133,364	1885	131,439
1882	178,807	1886	132,731
1883	137,441	1887	158,112

The shipments last month were therefore nearly 20 per cent. greater than they were in January, 1886, and are larger than the shipments of any other January since 1882. In 1882 they were about 13 per cent. greater than last month's shipments. They were also exceeded about 5 per cent. in 1880. But if the traffic diverted by the Lehigh Valley and other outside lines were included, the amount of traffic would probably be about the same last month as in January, 1880; and not more than 7 or 8 per cent. less than in January, 1882, when the rates were so extremely low that there could have been no profit to the railroads. For the last three months in 1886, the shipments were unusually large, and it was only reasonable to suppose that the shipments in January would have been considerably less than they appear to have been. That this was not the case would seem to justify the conclusion that there has been no diminution in the prosperity of the country; as the westbound traffic being largely supplies and manufactured articles is quickly affected by any cause which has the tendency to restrict expenditure.

East-bound Through Freight.

The east-bound through freight tonnage to the trunk lines in January was 794,293 tons. This is business originating at trunk line Western termini, or passing through from points west and destined to any points east of such termini. This is an increase of 86,000 tons, or 12 per cent., over the traffic in January, 1886. For the last eight years the January east-bound shipments have been, in tons:

1880	590,530	1884	653.027
1881	703,307	1885	871,947
1882	744.035	1886	708,700
1883	853,251	1887	794. 93

The tonnage last month was about 10 per cent. less than the January shipments in 1885, and 7 per cent. less than in the same month of 1883; but it was greater than the shipments for the corresponding month in any of the other years. Within the last two years the Lehigh Valley Railroad has become an active competitor for through freight, and while as yet it may not have carried a very large proportion of the aggregate through traffic, it has no doubt taken a considerable amount of business; and probably if its traffic in January was added to the business of the pool lines, the differences between the aggregate business last month and the traffic in the same month in 1883 and 1885 would not be very material. The trunk line tonnage for the last six months of 1886 was larger than that of the last six months of any other year since 1880, being over 6,000,000 tons; and it must be very gratifying to the roads to see their traffic continue so large as it was in January. The tariff rates in January, as now, were on the basis of 30 cents on grain from Chicago to New York. This is as high a basis as has been in effect since 1881. From Jan 1 to March 31, 1881, the tariff was on the basis of 35 cents; but the actual rates were very much below that basis.

While there has no doubt been considerable elasticity in the way tariffs have been maintained lately, it would seem that in the face of the large traffic offered the cuts would not need to be very deep and that a deviation of three to five cents from the tariff would be all that was needed to divert traffic This being the case, it would seem that the business must have been fairly profitable to the railroads.

The St. Clair River Tunnel.

The St. Clair River tunnel, the works preliminary to the construction of which are now in progress, is intended to connect the Grand Trunk and Chicago and Grand Trunk Railway systems at Port Huron and Sarnia, although it will be built by a company independent of the corporations owning and controlling these railways.

At present the connection between the above mentioned lines is maintained by a ferry, which transfers the trains between Point Edward in Canada and Fort Gratiot in Michigan. This ferry is about three miles north of the proposed tunnel.

The distance from Detroit by way of Port Huron and the Tunnel to Buffalo and Toronto respectively will only be about 8 miles more than the distance from Detroit by ferry across the river and the Great Western Division of the Grand Trunk to the same points, so that the tunnel, if successfully constructed, is likely to prove a very important factor in determining the route taken by the trade of Detroit.

The location of the tunnel was determined by the following considerations among others: (1) the comparatively small depth of water at the proposed crossing; (2) the tunnel and its approaches can be constructed on the same straight line; (3) the short length of new railway that will be required; for all practical purposes the tunnel approaches connect immediately with the main lines of both the Grand Trunk and Chicago & Grand Trunk railways; (4) the distance to be run by all through trains to and from the Great Western Division of the Grand Trunk will be reduced six miles, while it will not be increased for those to and from the Grand Trunk proper; (5) the favorable material in the bed of the river for tunneling. The borings show that the rock is from 90 to 95 ft. below the surface of the water, and that strong clay, in which not a trace of quicksand was discovered, overlies it; (6) the necessary land and right of way for the tunnel and its approaches will cost less than upon any other line within the limits available for selection.

The advantages to be gained by a construction of the tunnel are a reduction in the cost and time of transferring trains, and a degree of regularity in the service not always attainable by the ferry in consequence of the river being occasionally obstructed by ice in the winter and by vessels during the season of navigation.

The length of the tunnel will be one mile, of which 2,310 ft. will be under the river, 1,160 ft. under dry ground on the Canadian side, and 1,810 ft. under dry ground on the American side. Of the portion under the river, 1,500 ft. will be nearly level, having merely enough fall toward the east to cause any water finding its way into the tunnel to flow in that direction. At either end of this part of the tunnel there will be a gradient rising 1 in 50, or at the rate of 105⅗ ft. per mile, which will be continued through the open cuttings forming the approaches. The total length of the ascent on the Canadian side will be 4,970 ft., and on the American side 4,900 ft. The length of the open cutting at the east end of the tunnel will be 3,270 ft., and at the west end 2,820 ft.

The depth of the lowest part of the tunnel below the surface of the water will be 80¼ ft.; the minimum depth of the top of it below the bed of the river will be 15 ft.

The tunnel will be for single track only. In cross-section it will be circular, with a clear internal diameter of 20 ft.

The work which is now in progress is the construction of a trial heading or small cylindrical tunnel, with a clear diameter of six feet, under the river. This is being driven for the purpose of thoroughly testing the material. Although the borings were of a satisfactory character, there is, of course, a chance of pockets of quicksand being found between them. This heading if successfully completed will be of material assistance in the construction of the permanent work. It will be finished probably in about six or seven months.

Sub-aqueous Tunnels.

The construction of railroad tunnels under navigable rivers has not been very successful in this country, though the practice of boring tunnels under lakes in order to obtain a pure supply of water has possibly been more extensively carried out here than elsewhere. In point of engineering difficulty there seems no special reason why a railroad tunnel under water should be more expensive than a water supply tunnel, except that it is more difficult to make a large than a small tunnel.

The general difficulty in this class of tunnel has been the irruption of land springs. The tunnel under the river at Detroit was abandoned from this cause, and land springs more than once drowned out the Severn tunnel. In neither case, however, was there any serious leakage of river water. The history of the tunnel under the North River at New York is well known, and the difficulty of tunneling through mud under a deep tidal estuary is very obvious, and was forcibly illustrated in the history of the elder Brunel's costly tunnel under the Thames at London. The Mersey tunnel recently completed between Liverpool and Birkenhead was driven through solid rock, and was remarkably dry and even dusty during construction.

Each of the two Chicago lake tunnels runs under the lake for 2 miles, and the tunnel supplying Cleveland is 1¼ miles long. These tunnels are all, however, small, measuring from 5 ft by 5 ft. to 7 ft. by 7 ft. inside. The actual cost of the tunnels only appears to have varied from $19 to $40 per running foot.

The Grand Trunk tunnel under the St. Clair River, which is described in another column, is an example of a method of crossing a navigable stream which deserves careful consideration. A tunnel possesses the great and obvious advantages of not interfering with the navigation and of being unaffected by ice. In some cases the approaches are either shorter than those of a bridge or have a less inclination.

Railroad tunnels under navigable waters have been used in many situations where a bridge would interfere most seriously with the navigation, and the approaches would be very long and costly.

The tunnels under the Severn, Mersey and Thames all carry a very heavy passenger traffic, and the first-named carries a good deal of freight. The approaches to the Severn tunnel have a grade against the prevailing traffic of 53 ft. per mile, and in that respect differ considerably from the proposed Grand Trunk tunnel, where the approaches are inclined at the rate of 105 ft. per mile. A similar grade has been used in the approaches to a small tunnel on the Great Eastern (England), where the line dips underneath a dock basin instead of crossing it by a swing bridge. Considerable difficulty was, however, found in working it, owing to the freight trains breaking loose in the tunnel. The sudden changes of gradient jerked the train and fractured couplings in spite of every effort being made to keep the train stretched by keeping the brakes hard on in the rear cars, while the engine kept on steam down the incline. When, however, the engine struck the up grade, the cars

crowded on it, and then rebounded as they in turn struck the grade. The difficulty might possibly have been overcome had the grade been changed gradually, and it might be advisable for the Grand Trunk authorities to consider this point in their new tunnel.

January Accidents.

Our record of train accidents in January, given in this number, includes 54 collisions, 73 derailments and 13 other accidents; a total of 140 accidents, in which 46 persons were killed and 137 injured.

These accidents are classified as follows:

COLLISIONS:		
Rear	32	
Butting	17	
Crossing	5	
	—	54
DERAILMENTS:		
Broken rail	16	
Loose or spread rail	5	
Broken bridge or trestle	4	
Broken switch	3	
Broken wheel	8	
Broken axle	7	
Loose wheel	1	
Misplaced switch	3	
Cattle on track	2	
Snow	1	
Land slide	1	
Accidental obstruction	1	
Malicious obstruction	1	
Wind	2	
Rail purposely misplaced	2	
Unexplained	21	
	—	73
OTHER ACCIDENTS:		
Boiler explosion	3	
Broken parallel rod	2	
Broken axle	3	
Miscellaneous	5	
	—	13
Total number of accidents		140

The causes of collisions where given were as follows:

Trains breaking in two	4
Misplaced switch	1
Failure to give or observe signal	12
Mistake in giving or understanding orders	4
Snow	1
Maliciousness	1
Unexplained	32
Total	55

A very large portion of the unexplained doubtless belong to the "failure to give signals" class.

A general classification shows:

	Collisions.	Derailments.	Other.	Total.	P. c.
Defects of road	..	28	..	28	20
Defects of equipment.	..	11	11	22	16
Negligence in operating	22	3	..	25	17
Unforeseen obstructions	2	7	..	9	8
Maliciously caused	1	3	..	4	3
Miscellaneous	..	..	2	2	1
Unexplained	29	21	..	50	36
Total	54	73	13	140	100

The number of trains involved (not the number of accidents) is as follows:

	Collisions.	Derailments.	Other.	Total.	P.c.
Passenger	30	35	8	73	39
Freight and other.	72	38	5	115	61
Total	102	73	13	188	100

The casualties may be divided as follows:

KILLED:	Collisions.	Derailments.	Other.	Total.	P.c.
Employés	9	14	3	26	57
Passengers	15	1	..	16	35
Trespassers	..	..	4	4	8
	24	15	7	46	100
INJURED:					
Employés	31	35	6	72	52
Passengers	11	54	..	65	48
Trespassers	..	..	..	..	..
	42	89	6	137	100

Twenty three accidents caused the death of one or more persons each, and 44 caused injury, but not death, leaving 73—52 per cent. of the whole—in which the injuries were too slight to report.

The comparison with January, 1886, shows:

	1886.	1885.	Inc. or Dec.	P.c.
Rear collisions	32	20	I. 12	60
Butting "	17	10	I. 7	70
Crossing "	5	5	..	..
Derailments	73	54	I. 19	35
Other accidents	13	5	I. 8	160
Employés killed	26	40	D. 14	35
Others "	20	1	I. 19	1,900
Employés injured	72	67	I. 5	7
Others "	65	23	I. 42	183
Pass. trains involved in accidents	73	41	I. 32	78

Average per day:

Accidents	4.51	3.03
Killed	1.48	1.29
Injured	4.42	2.90

Average per accident:

Killed	0.328	0.426
Injured	0.978	0.957

The only decrease of consequence shown is in the number of employés killed. It is gratifying to see this item shrink; but the one next below it, which covers the Republic collision, presents figures that are startling. The number of persons in passenger train accidents is an exceedingly unreliable ground for comparison, for some reporters will report a dozen passengers injured where another would mention perhaps only one or two. It will be seen that the total number of persons killed does not vary so greatly from last year, but in 1886 it was composed almost wholly of employés and scattered along through the month, while this year passengers suffered much more severely in proportion, and the horrible circumstances have focused public attention upon the facts, so that action tending to remedy some of the dangers of railroad travel is already resulting.

The violent wind storm in Colorado Feb. 17 blew from the rack no less than four trains, three passenger and one freight, one of them going over the side of a bridge and a mail car being burnt up in another. These reports have came in with great regularity for a good many winters, and it would seem that narrow gauge roads have in the lightness of their cars an irremediable drawback, and that no one can ever feel safe to take a trip in such unsubstantial vehicles without first consulting the meteorological probabilities. Snow, also, is in the nature of things an obstacle whose importance is directly proportioned to the lightness and weakness of the rolling stock. The contrast between the regularity of trains on the Central Pacific, with its heavy engines and frequent trains at the present day, and its great difficulties with snow blockades in earlier years shows in a strong light the advantage which heavy engines will always have over light ones.

The description of the Whitner automatic brake appliances, which were referred to in these columns last week, was, by an unfortunate oversight, omitted, but will be found in the Technical Department of this issue.

The telegraphic summary of the report of the coroner on the Republic collision indicates that the principal stress is laid on the poor condition of the freight engine and of the passenger train brake, the unreasonably long hours the men were required to work, and the "dangerous and unlawful" heating appliances. We have not seen any definite evidence in regard to the brake, but assume it to have been the Loughridge non-automatic. If, however, it was in its normal working condition, the brake must have been capable of reducing the speed much more than it was reduced, and there seems still to be room for attaching a good deal of blame to the passenger runner for not being more vigilant.

The coroner is reported as deciding that the freight runner was "not in liquor." Quite likely the evidence at the hearing failed to prove anything on this point, but it is hard to believe that the "unofficial" testimony published at the time, giving such circumstantial proof of engineman Kiler's condition, had no foundation in fact. Seventeen hours continuous service is a very unreasonable burden to put upon a man, and it is well to read superintendents a forcible lesson on this text; but what shall be said of a man in ordinary health who defends himself from the grave charge of imperiling scores or hundreds of lives on the plea that he cannot keep his wits about him from 6 a. m. to 11 p. m.

The Vermont Railroad Commissioners in their report on the White River disaster give the number of persons killed as 30, and of injured 37. They regard the broken rail as the original cause of the accident, and say in regard to it: "The part broken off was found to be in several fragments, and at the several points of fracture showed a defect running lengthwise of the rail on the inside, beginning near the end and running back and gradually extending deeper into the body of the rail. The defect was in the bloom from which the rail was rolled, and appeared at no point on the surface, and could not have been discovered before it broke. The rail was from Bessemer steel, was rolled at St. Albans, and weighed 60 pounds to the yard."

The Commissioners refer to the "middle journal in the forward trucks," and say that the *journal* was broken midway between the wheels. This, with the statement that the absence of guard rails did not contribute to the causes of the accident, would seem to indicate that the technical member of the commission has not yet been appointed. A mild general warning regarding the protection of bridges and approaches is given, however; and, although systems of "lighting by electricity and heating by steam from the engine would not be unattended with danger in certain classes of accidents," the roads are recommended to adopt them before next winter, unless something better is discovered meanwhile, and to "hold conferences with connecting roads, so as to make the desired changes as soon as possible."

Holding, as they do, that a guard rail would not have tended to prevent the fatal plunge, and that no blame attaches to the railroad management for not having taken warning and provided safe heating apparatus long ago, the Commissioners very naturally come to the mild conclusion that "there was no culpable negligence on the part of the railroad company.

An exchange has among its "Crimes and Accidents" the heading

"A CAR COUPLER KILLED AT NORTH ADAMS."

But does not say whether it was of the vertical plane or link-and-pin type. An anxious public (of master car-builders) awaits with interested expectancy, the fuller reports which shall confirm their longing hopes that the good work has really begun.

The prospects of the proposed Railroad Jubilee in France, celebrating the fiftieth anniversary of the opening of the first railroad in France—that from Paris to St. Germain—do not seem particularly bright. Not only do the six great French railroads decline to take part in the proposed exhibition of rolling stock and railroad materials, but the London *Engineer* announces that the Institution of Civil Engineers of France and the Minister of Public Works have also refused their support.

A dispatch to the New York *Tribune* says that a hot-water heater, in a chair car, on the Wabash, St. Louis & Pacific exploded at Sidney Station, Ill., about 1 a. m., Feb. 22, breaking all the windows and shattering the car, which, after the passengers had escaped, with not very serious injuries, was burnt up by fire from the heater and the lamps.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the *Railroad Gazette* as follows:

Chesapeake, in Virginia, 4 miles.

Fort Worth & Denver City, between Chillicothe and Juanah, Tex., 8 miles.

Gulf, Colorado & Santa Fe, in Indiana Territory since last reported, 17 miles.

Orange Belt, from Monroe Station, Fla., to Oakland, 34 miles.

San Antonio & Aransas Pass, from San Antonio, Tex., toward Kerrville, 14 miles.

This is a total of 77 miles for the week, making 387 miles reported thus far for the current year. The new track reported to the corresponding date for 18 years has been:

	Miles.		Miles.		Miles.		Miles.
1887	387	1883	2 0	1879	97	1875	80
1886	102	1882	452	1878	198	1874	104
1885	107	1881	196	1877	82	1873	304
1884	184	1880	479	1876	2 4	1872	201

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

Railway Management at Stations. By E. B. Ivatts, Goods Manager of the Midland Great Western Ry.

Messrs. McCorquodale & Co., Publishers, 55 Cardington street, Euston Square, London, announce the second edition of this excellent work, which was noticed in the *Railroad Gazette* June 26, 1885. As was said at that time, the book contains a large amount of minute and reliable information very carefully put together. The price, postpaid, is 6 shillings, 8½d.

American Institute of Mining Engineers—Scranton Meeting.

In some of the towns of Pennsylvania, near Scranton, there has been a settling of the earth in certain instances to such an alarming extent as to make those instances uncertain, and when the good people of the region sang in stentorian voices: "How firm a foundation, ye saints of the Lord," they felt that although the saints in question might believe in a "firm foundation," yet the sinners living in coal mining communities had every assurance that their personal and individual foundations were anything but "firm," either in this world or in the next. Now, Scranton has not been treated to a great deal of this sort of settlement, and although there has been an individual case now and then, yet it has not been of that serious nature which would lead an inhabitant to retire at night to peaceful slumber, and awaken to find himself literally "down in a coal mine, underneath the ground."

It is believed that the projectors of this meeting of the Mining Institute at Scranton had one of two motives in view. Having a great love for their beautiful town and a strong desire for its future welfare, they thought that, by having such an assembly of mining engineers in their midst, they would learn the probable chances of such settlement and the best means of preventing it, or else, with a certain cunning desire for revenge, they intended to get the Institute at Scranton and settle *them* into the mines, and thus, by destroying the cause, they would avoid the effect and give solemn warning to all future miners not to go under populous towns, or if they did, not to rob the mine of all supports.

Whatever their motive, all who attended the meeting will forgive them, for everything was done for our comfort and pleasure during our stay at this city.

The first incident was the "informal reception."

Informal receptions are distinguished from "formal" ones by various marks. In the "informal" the various refreshments of a liquid character are usually placed on the table; but in formal ones they are always kept behind the door or under a bed in the gentlemen's dressing-room. There are other distinctive marks, but the Vice-President of the Mining Institute is the husband of the President of the Woman's Temperance Union, which, by the way, is not temperance at all, but intemperance; in other words, an abstinence union, hence on his or her account, or on account of the place of meeting—the Y. M. C. A. rooms—there was nothing stronger than coffee, so the first difference could not be discerned. So we concluded "informal" must mean no dress coats, and all took that view of it.

Judge Hand made a very fluent, elaborate and entertaining address of welcome, and all present enjoyed it immensely, and to such an extent that they forgot for the mament that the chairs had wooden seats and, though in the Y. M. C. A., were just as hard as those in a dime museum. We were told that Scranton had 85,000 inhabitants, miles of underground streets, and everything to make it attractive, including a new jail. Our teetotal Vice-President responded in *flowing* language, (if he will pardon the phrase, it was only a coffee flow), and if he did so well on coffee the query arose, what would he have done if he had wrapped himself around one bottle of champagne.

The biographical sketch of Mr. Martin Coryell had a most peculiar significance here, and was prepared and read by Dr. R. W. Raymond in his best manner. It was most fitting that among the scenes of many of his engineering triumphs we should pay our last respects to his memory.

Dr. Persifor Frazer (whose first name is always spelled incorrectly) gave an interesting account of the doings of the Geological Congress, and a sketch of the efforts made to produce a universal geological language. This is indeed a most important matter, and if it results in applying to some of the monsters of antiquity names which are somewhat shorter than their pedigrees, and which can be pronounced fluently by any but Welshmen or persons without palates, it certainly deserves the highest encouragement. The Society for the Prevention of Cruelty ought to intervene and prevent such fearful names as are in vogue at present. But this last week a graphic picture of the dying Ichthyosaurus was presented to the readers of "St. Nicholas," the animal, a respectable and ancient type of his race, having gone down to an

untimely grave when he heard what he had been named by posterity. A very satisfactory collation and coffee closed the evening and all retired to their needed slumbers.

On the following day, the clans assembled and made a careful examination of the works of the Lackawanna Coal and Iron Co., one of the oldest organizations in this region. There was nothing specially new in their plant, although it gave extremely satisfactory results, and from there the party went to see a new pumping engine, whose principal merit, so far as could be learned, lay in the fact that it was uglier than any form extant at present. Different points of interest in the city completed the afternoon, and among them were the homes of Mr. Scranton, after whom the town was named, and Mr. Platt, who has been identified with it from "way back," the Moses Taylor Hospital, which is not yet completed, and the new jail, to whose "classic shades" we had been so heartily welcomed by Judge Hand.

The writer having heard of the Scranton electric road, and having been invited to ride over it at *his own* expense, tried it, in one of those touching bursts of confidence which are the admiration of the world at large. His watch now persistently points from one to two hours late, and the next one who recommends an electric railway to him had better be ironclad unless he has a good life insurance non-forfeitable policy.

That evening Mr. Hill, of the Pennsylvania Geological Survey, discoursed as to the general characteristics of the coal of that section, and Mr. Ashburner promptly sprung the glacial epode with its attendant horrors on all present, which cooled them to such an extent that they were glad to hear of something warm, which was presented by Mr. E. V. D'Invilliers, in the shape of a paper prepared by him and Mr. A. S. McCreath, denominated "Comparison of Some Southern Cokes and Iron Ores." This was a clean refutation of the fact that "comparisons are odious," for he showed that these ores were good, at least, some of them are, and his remarks were well received by all who have interests in those particular sections. Dr. Raymond then read a paper on the cost of pig-iron in the sections just named, and it was the general sentiment that a fortune awaited the man who could transport this pig to the market *by wire* and thus save the usual transportation charges.

This being the great centre of waste products, to wit, "culm;" remarks were in order, and here again there seemed to be no end of money for that party who would furnish "culm" at cost in manufacturing centres. N. B.—Cost is nothing. A few remarks from Mr. Hardin on Gas Furnaces closed the evening, and the society adjourned till the next morning.

The first object of interest was the Pine Brook breaker, which is the largest and most complete of its kind in this region. It was not running, but we saw how it would run and were spared the dust attendant on the operation. After this we visited the Dickson Manufacturing Co., and were shown tools that take hold like "poverty to an honest man," and gouge a half inch chip at a time, yet which are capable of being adjusted to take out a film so delicate as to be almost beyond belief. A few were invited to go to the Scranton Steel Works, and your correspondent by virtue of his office was among the elect. He went and has no hesitation in saying that for their size, these works are the most complete in the U. S., if not in the world. Our small party were escorted by the manager, Mr. McKinley, and the night superintendent, Mr. Stanton. This mill is now rolling 120 ft. rail and is preparing to make this 180 ft. Their converters are seven tons, and the output is about 400 tons of rails daily. Every appliance to save labor may be found here, and under such intelligent management it is not difficult to predict the future of these works.

In the afternoon one of the most interesting papers of the session was presented, viz.: "Rail Sections," by Mr. W. F. Mattes, Chief Engineer of the Lackawanna Iron and Coal Co. It was illustrated by a large number of diagrams showing the standard shapes of various railways, and also the wear on such forms. Their defects of shape was carefully dwelt on, and the remedy proposed was elucidated. As may be readily seen, the most desirable form was that offering the least wear from the action of the wheel. A more detailed account of this paper and the full discussion will be given to the readers of the *Railroad Gazette*, at which time the standard sections will be shown, and their respective merits treated of.

Mr. Mattes received the thanks of the Institute for this able presentation, which he modestly acknowledged.

Some remarks by Mr. Amos Boreman of the Geological Survey of Canada followed, and under the threatening aspect of the Fisheries Question they received more than a passing notice. If we must fight Canada, how important it will be for us to look below the surface, and if an army advances with the protection and under the ægis of the Palæozoic Age, it will be of prime consideration for us to oppose them with the lowest strata, and thus undermine and drop their works to that period at which the Cardiff Giant was an infant. The word "Geology" was to such veterans as Dr. Sterry Hunt and Prof. Egleston like a red flag to a bull, and it was no time before they were in full flight of oratory. Dr. Hunt only got, however, to the Triassic Age, and rested.

The next paper was on the Microscopic Structure of Steel Rails, and simply showed how much fine work a man might do without adding anything to the general store of knowledge. The investigations were elaborate, and yet the results of little or of no value. The author was evidently an anglo-maniac, and advanced the insane proposition that English rails lasted longer than American. Mr. Wm. White, of Pittsburgh, whose well-stored mind was equal to the occasion, and who has investigated all the best plants here and abroad, promptly proceeded to annihilate the unfortunate author, who reluctantly admitted he had investigated less than twenty samples. This is a sad commentary on the Publication Committee of this Institute. In the evening, the Institute assembled to hear papers read by title, but contrary to the usual run of things, such papers in some instances elicited a lively discussion. The first paper, on the "Saving of Sulphur and Ammonia from Gas," by Mr. W. H. Adams, was discussed by Professor Egleston, who showed that saccharine matter had been obtained from their by-products. The next paper, on "Magnesium Carborate as a Non-Conductor of Heat," by E. Luttgen, of Ambler, Pa., was extremely interesting, and its author showed conclusively that it was the best coating for steam pipes known.

The next paper was the "Apparatus for Volumetric Determinations with Potassic Permanganate," by Clemens Jones, of Hokendagua, Pa. Whether the title or the residence of the author were discouraging cannot be stated, but in spite of the calls of the Secretary for Dr. Droone, that gentleman did not materialize, and therefore the paper was undiscussed. This, however, could not be said of the next paper, viz., "The Animikie Rocks, and their Vein Phenomena as shown at the Duncan Mine, Lake Superior," by W. M. Courtis, of Detroit. Evidently Dr. Hunt had been waiting for this topic, and in its announcement, he swooped like the traditional hawk on the June bug, and he turned it inside out and top side down. Before he had concluded the assembly knew more about the Animikie Rocks than they did about their alphabet, and the saving clause was the extremely interesting character of the doctor's statements. As the Scranton paper stated, it was "Dr. Sterry Hunt's brilliant geological explanation." At its conclusion, Mr. Moffat showed a very interesting sample of what he denominated "Modern Anthracite." It was originally a prop supporting the roof of a mine, which had taken fire. The bottom of the prop was wood, the centre, charcoal, while the part of it immediately against the roof seemed to have become compressed into a substance very closely resembling anthracite coal. The time during which this change had been effected was stated to have been about 17 years. "Experiments in Matting Sulphides," by E. Gybbon Spilsbury, closed the evening.

The next morning the party assembled to take a trip on the railroad, which would give them a fair idea of the region. In spite of the unfavorable weather, the party were in excellent spirits. The word "unfavorable" hardly describes the weather properly. It was just the kind of a day to thoroughly suit a signal office probability. It was "partly clear," a very small part, and "partly cloudy," a very large part, "threatening storms," and carefully fulfilling its threat, "with local rains, followed by snow, and a rising and afterwards falling barometer, with lower followed by higher temperature." We had them all, especially the rain and snow, until, like Horace of old, we almost exclaimed, "*I am satis terris, nivis atque diræ.*" We stopped at the traditional battle field of Wyoming, and saw the monument, which some of our near-sighted members thought was a charcoal furnace. The "oldest inhabitant"—there are a number of him—was out in full force, and told us all about the massacre until, like Apollo, we would fain worship "the ancient lyre." It was also stated to us, that no one possessed any social standing in this valley, unless he was Dutch or had an ancestor in this battle, as the names of those who were killed are carefully inscribed on the monument. A man of genius by examining it before coming to settle can readily select a suitable master, and thus reach by a leap all the social distinction desirable. At the conclusion of a delightful excursion and a satisfactory dinner, the final session was resumed, and the forty-seventh meeting was suitably closed by a banquet that evening, at the Wyoming House. The party separated with pleasant recollections of Scranton and of its hospitality.

Contributions.

Elevation of Curves.

CANON CITY, Colo., Feb. 3, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

SIR: The articles from correspondents in your issues of January 7 and 28 concerning gauge and elevation of curves, and the derailment and overturning of a car-load of coffee on a narrow gauge road are a little off in the conclusions in regard to the initial cause of that accident. Your correspondent of the 7th, after explaining that the curve was in bad surface, with irregular elevation varying from 4 to 7 inches, then makes it appear that excessive elevation, ordinary snug gauge, and a top-heavy, lopsided load were the cause of the trouble, and he blames the gauge most of all. Of course the excessive elevation and top-heavy load contributed to causing the accident. But had he examined the affair more minutely he would discover that the origin of the trouble was a short, sudden twist in the track surface, due to irregularity in the elevation, and that while the hind trucks of the car rested on a spot having 7 inches elevation, the forward trucks occupied ground having an elevation of 5 inches or less. In this case the car would list to favor the hind or most sidling truck, throw excessive weight on the low side of the leading truck, and cause it to tilt to low side sufficient to raise the wheels clear of the outside rail, and when moved forward in this position the suspended wheels would naturally cross the rail to the outside of curve.

I can best illustrate this by describing a mishap that occurred to me while handling a car load of ties on a narrow gauge road not long since. The car was loaded to the roof with heavy green ties, and was moving at three miles an hour over a 24 degree curve that had been lately washed out and only temporarily repaired. The curve had been surfaced to a 3 in. elevation (for trains running 10 or 12 miles an hour), and was one inch wider than common gauge. A weak spot in the roadbed had allowed a rail length on the low side to settle enough to make the elevation 6 in. at that point, or about double as much as it had elsewhere. The front end of the car came over all right, but when the hind truck reached the low spot, and while the forward truck was passing a point that had but little over 3 in. elevation, the car body listed to accommodate itself to the extreme tilt of the hind truck, and tipped over the front truck nearly to correspond with the incline of the car body, the outside wheels were lifted clear of the high rail, and passed outward over it in moving a few feet ahead. We could not frog the truck on by pulling forward, but finally backed on over the wrecking frogs. We made several efforts to move out of the hole, but at every effort the wheels on the high side of the front truck would raise up from the rail and start to go over it, and we finally got out by using a 20 ft. rail as a lever between the car bottom and truck to force the suspended wheels down to the rail and hold them to a bearing while pulling out of the surface twisted spot. The car truck did not require the extra inch in width of track gauge, but our engines did, and if "M. R. Roadmaster" was required to make extremely sharp curves passable for ordinary road engines where bob-tail engines were not at hand, he would soon discover the necessity of widening the gauge.

An elevation of 6 in. may be rather excessive for 3-foot gauge, but if the curve referred to in this case had a uniform elevation of 6 in. all around, our car load of ties would have passed over it without mishap. In fact, irregular elevation is more to be feared than high elevation, provided the latter is uniform and tapered off not more than an inch to 50 ft. in reaching a true level on tangent adjoining the end of curve.

"M. R. Roadmaster's" theory relative to excessive weight on wheels on low side of curve causing wheels on opposite side to grind harder against the outer rail, has considerable merit if applied in a case of low speed and high elevation But this merit is lost according as speed is increased and the bearing thrown to high side by centrifugal force. Of course the elevation of curves must be made consistent with the speed of trains for each road or division, but it is safer to have it a little over than anything under the exact requirement.

D. SWEENEY.

Fire Pumps on Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Should not locomotives be equipped with fire extinguishing appliances, as are steamboats, for the protection and security of passengers? Any person who has read a description of the White River disaster, or of many similar ones, would say they should.

The Marine law furnishes us a good example of the interest taken by the government to protect passengers on vessels from the horrors of being burned to death. A law has been enacted providing that every steamer shall be completely equipped with all known fire extinguishing appliances, prohibiting also the use of coal oil on board for illuminating purposes. I will here only mention steam pumps, as one of the means that steamboat owners have to provide on vessels for fire purposes; these must be placed in a position where they can readily be got at, and have attached to them hose of such length that they can throw water over the entire vessel. They must also have hose wrenches, hose nozzles and coupling, and all these must be tested in the presence of the inspector to prove them in good working order and strength. Should any of the minor articles be lacking, certificates are withheld until these be furnished.

This leads us to ask in surprise, "Why has not this same interest for the people's safety been extended to the railways, when they convey a thousand passengers for every one that steamers carry?" I, for one, do not for a moment believe that railway managers are unwilling to incur all necessary expense to provide requisite means for the protection of life and property, but simply that a practical way of equipping engines has not been brought before them. I am led to say this, never having heard or read of anything in this way being done.

Foremen have proudly shown me their auxiliary car, furnished with everything necessary for the speedy removal of all *débris* from the line, but with no provision whatever for the prevention of these disastrous fires. When accidents result in the destruction of coaches by fire, from either stove or lamp, the locomotive is rarely damaged, and insurance companies' statistics prove that the largest proportion of fires is extinguished with pails of water. This shows that by turning a small stream of water into a coach, all danger from fire may be prevented.

A locomotive has within itself everything necessary to turn it almost instantly into a self-propelling steam fire engine, and, in addition, has attached a water tank that contains an average of from two thousand to four thousand gallons, always at hand.

To equip for fire extinguishing, fasten an ejector upon the side of the boiler, connecting it by steam pipe from the dome, and have a strong rubber suction hose from the tender tank to the ejector, a ¾-in. rubber delivery hose always attached upon the ejector, and of such length as to reach the last car of the train. This furnishes an appliance that will discharge a stream of water into any car of the train, two minutes after an accident, if managed by a cool-headed fireman.

The above arrangement is only intended for instant use, and I would have a steam pump of sufficient capacity slung upon the side of the tender tank of every passenger engine, with tackle for speedily detaching and lowering it to the ground safely. It could be conveyed to a river to take water for staying the ravages of fire, that the ejector had not capacity to do. Carry steam from the locomotive to the

steam pump through steam hose. The pump should have 500 ft. of 1½ in. strong delivery hose, branch pipe, wrenches, etc. An intelligent driver would refill his tank as opportunity offered by this steam pump, and would thus save life and property just as well as a steam fire engine could do coming upon the same ground. N. T. & Q.

Heating and Ventilating Cars.

The usual monthly meeting of the Master Car-Builders' Club was held at their rooms, 113 Liberty street, New York, on the 17th inst. Mr. C. E. Garey, the President, presided.

Mr. DAVIS moved that the subject of changing the name of the association be deferred until the next meeting. Carried.

The PRESIDENT announced that the subject for discussion was the heating, ventilating and lighting of railway passenger cars.

Mr. W. G. BAKER opened the discussion by stating that during the last twenty years over a million people had been warmed by his heater, and that he was the first to invent a plan of heating cars by steam. He advocated an improvement in the present heater instead of adopting some entirely new principle. The Baker heater could be enclosed by a species of safe. The safe used in an express car seldom suffered from an accident. He had informed Mr. Depew, the President of the New York Central Railroad, that he would subject an ordinary car fitted with his heater to the test of an actual collision. Mr. Depew said that he would investigate any system that was fireproof. The Baker heater was seldom broken in a collision, and the addition of a safe would make it perfectly secure. In the White River accident the flames started in the car with the stove.

Mr. W. G. CREAMER: The newspapers insist that the only safe method of heating cars is by steam from the locomotive, but a Baker heater properly protected would be equally safe. The rails, the wheels, the axles, the spikes, and the want of guard-rails are also elements of danger that should be attended to. The primary business of a railroad car is to stay on the track, but it should be so arranged that it does not catch fire in an accident. Common, cheap wood stoves are used in all baggage, mail and express cars. The stoves are often not even fastened down, and are a great source of danger. A stand of vertical radiating pipes, two or three feet high, and cased with ornamental sheet-iron, should be placed in the end of each car and connected to the locomotive. Fresh air from the outside should circulate around that heater and be radiated into the car through registers between the seats. The large volume of air would be warmed and the temperature of the car could be regulated with perfect safety and give ventilation. Many steam heating appliances now in the market do not give ventilation. Air should be admitted on the side of the car, low down, and not from the roof.

Mr. RODERICK H. SMITH: We are all agreed that the old stove is dangerous, and I consider that any stove is dangerous. The Baker or any similar heater may decrease the percentage of risk, but does not eliminate it. The terrific force exerted in collisions renders any stove, however well protected, a source of danger. No stoves of any kind should be used. A train heated with steam on the Boston & Albany is said by the Massachusetts Commissioners to be the best heated and ventilated train in New England. Trains heatedon this system are also regularly running on the Milwaukee, the Cleveland, Columbus, Cincinnati & Indianapolis, the Dunkirk, Allegheny Valley & Pittsburgh, the Long Island and other roads. In this device, the Martin anti-fire car heating system, the steam is taken from the locomotive and is reduced to a pressure of 2½ lbs. by passing through a reducing valve. Metallic joints are used. Two pounds of coal burnt in the locomotive will heat one car one hour. The engineers running either device find no appreciable increase in the consumption of fuel. We have never heated a train of more than five or six cars. Trains standing in the depot can be heated through a steam pipe between the tracks and attached to the cars in the depot. A car can be heated by the engine in ten minutes.

Mr. W. G. BAKER stated that Mr. Emerson claimed that steam heating would save fuel by the reduction in dead weight. The consumption of steam in steam heating is very small. About 40 lbs. of coal in 24 hours will heat a car in ordinary weather. Heating by steam from the engine presents many difficulties on long journeys. I tried to heat a train on the New York Central with steam from the engine and failed.

Mr. EMERSON had been heating cars by steam for over five years on the Connecticut River Railroad. It is now applied to twenty-two trains. The breakage of a pipe in the Baker heater would be dangerous. We keep the cars at 65 deg., which is warm enough. We have never heated but four cars on a train. There is no difficulty when the thermometer is 6 or 8 deg. below zero. When the cars get too warm we shut off the steam. When the thermometer shows 62 we shut the steam off in the circulating coils in the body of the car, and let it go in coils of pipe on the deck. The Baker heater sometimes explodes. Two blew up in the yard at Springfield last winter, and one at Albany.

Mr. HOPKINS believed that steam heating could be successful on an extended scale. No heater could be made to stand a collision.

Mr. GOLD: My system is in operation on the Elevated roads on some 800 cars, and on 81 cars on the Long Island. We store the heat in about 22 gallons of water for each car. This will last two hours. We use two lines of pipe throughout the train. One can be used if the other fails. A car can be heated in five minutes.

Mr. CLIVE advocated a method of heating that has been used on the Chicago West Side Division street railroads.

Mr. R. B. OWEN claimed that his firm had made some improvements on the Baker heater. Our heaters are in use on the New York Central and by the Wagner Car Co. and on Mr. Toucey's private car. We heat by the use of hot water and use about 400 ft. of 1¼ in. pipe per car. The temperature of the water is about 160 deg. If the brakeman leaves all the doors open there might be danger.

Mr. BAKER denied that the Baker heater had ever exploded inside the car, though the drum on top had burst.

Mr. OWEN: None of our heaters have ever exploded, the coil, the only part exposed to pressure, is made extra thick.

Mr. C. C. SHEBY described a stove of his invention which could be extinguished in the event of an accident.

The Chairman announced that the subject would be continued at the next meeting.

THE SCRAP HEAP.

Early Blast Furnaces.

The recent item in these columns with the above heading was from a letter of Mr. J. M. (not J. W.) Goodwin's, and by a misprint the amount given as the equivalent of £120 was made $583.20 instead of $58.32.

The explanation of the peculiar exchange value is given below.

As to the prices named: The initials "O. T," appended to the 22-6 (twenty-two shillings and sixpence), the price of the hand-saw files, mean "Old Tenor." At the time when the foregoing letter was written, and for many years thereafter, the people of New England, aup indeed of all the colonies in America, suffered incalculable inconvenience, and hindrance in business affairs, because of the great scarcity of "hard" money and in fluctuations in value of their local "paper" currency. The value of any "money" was, finally, referable to the English "Sterling" basis; and in order to get any idea of the actual money value represented by any of their "currency" prices we have to ascertain in figures at which any such prices would have been stated in English £. s. d. (pounds, shillings and pence).

According to a table in "Ames' Almanac" for 1762, the English Guinea (5 dwt. 9 gr. gold), representing something more than one "pound sterling," was worth £10 10s. Massachusetts "Old Tenor," and £1 8s. of Mossachusetts "lawful money." The English shilling (silver) was worth 10s. Mass. O. T., and 1s. 4d. Mass. lawful money (then designated in accounts by the sign Lm).

By the above we learn that Massachusetts O. T. was worth just one tenth "sterling."

Reckoning the Pound Sterling at $4.86 of our present legal money, the 22 6 O. T., the price of the files, is equivalent to 54⅗ cents, and the "chest lock" price (£8 per doz.) is equivalent to $3.89. Hand-saw files are now worth 60@85c. per doz.

In a store bill of 1762 I note these items: "½ doz. pins, No. 4; 0. 6. 0; ½ doz. pins, No. 12; 0. 4. 8." These "pins" were hand-made "toilet" pins; and, as above, "No. 4" cost something more than 29c. per dozen.

The Hancock Inspirator Co.

The Hancock Inspirator Co., of Boston, celebrated the manufacture of their one hundred thousandth machine by a dinner to their employés and a few friends at the Quincy House, Monday evening, February 21. Among the guests present were Messrs. Taylor, Kolseth and Shepard, of the Boston & Lowell road; Mr. Richards, Master Mechanic of the Boston & Providence; Master Mechanic Stewart of the Fitchburg road, and Mr Miller, of the *American Machinist*. Remarks were made by President Whitney and Treasurer Blakemore of the Company, Mr. Miller, Mr. Taylor, and Mr. Richards. The Temple Quartet rendered a few selections, and the affair was a very enjoyable one.

Now Let it Go at That.

Some of the scissors editors sprinkled all the way from Skowhegan, Me., to Seattle, W. T., are wearing pretty old shoes from force of circumstances, but the oldest shoes on the hungriest man among them don't approach the antiquity of that rheumatic yarn that they are continually reproducing with fiendish glee about Chauncey M. Depew issuing an order to brakemen directing them to "step inside the car and call out the name of the station in a clear tenor voice," and getting a note asking "wat kind of a tenor voice do you ekspect for $40 a month?"

Since that jest was saddled on Mr. Depew, its concocter has died and been forgotten by his closest friends. Mr. Depew has made no less than 4,028 after-dinner speeches in the meantime. The brakemen on the New York Central have worn out more than $8,000 worth of uniforms. But the scissors editor still makes that poor old battered story hand in its annual report. It was quite a merry thing at the start. But when it was ricochetted into this office last week it had lost its rose-leaf bloom, was pale and wan and looked anxious for a decent burial. Will the snippers of the press please let it stay right where it fell?

The statement is for the year ending Dec. 31:

	1886.	1885.	Inc. or Dec.	P. c.
Times printed.....	401,006	560,111	D. 159,105	D. 28.4
Expense	000,000	000,000	000,000	0.0
Net times printed.	401,006	560,111	D. 159,105	D. 28.4

By an examination of these figures it will be seen that unless humane measures are instituted at once we shall be compelled to wait some three years more ere the expenses create a deficit in the times printed.

The Y. M. C. A. Brakeman in Michigan.

The blizzard through his whiskers blew
And froze the breath on his blonde moustache,
His train was six days overdue,
So he softly murmured, "Oh, dash!"

Pennsylvania Coal and Iron Trade.

The producers of steel rails declare that there is no danger of foreign made rails coming into this country to such an extent as to interfere with the market for the home made product. The Pennsylvania Railroad Company has recently imported steel rails and put them down. The executive officials of that company, however, state that it is for purposes of comparison with those manufactured in this country.

Prominent manufacturers, especially those associated with iron, state that the question of wages will hereafter receive a more intelligent consideration than heretofore. The men are working regularly and in the majority of cases are receiving 25 per cent. more pay than at the same time last year.

There has been a noticeable stocking up in the demand for iron in the last week, but this will give manufacturers an opportunity to catch up, as nearly all of them have oversold. It is the opinion of the most prominent manufacturers that, save for the strikes in New York, the demand would have been beyond the capacity of production.

In the last month there have been eleven anthracite furnaces put in operation, of which two are in the Schuylkill Valley, three in the Lehigh Valley, and the others in the middle and western portion of the State. In the last twelve months there have been thirty-three anthracite furnaces put to work in Pennsylvania.—*N. Y. Tribune.*

Fly-Time in February.

If the Philadelphia & Reading Railroad has any pride in its record and in its reputation for pluck and veracity it will do well to bring forward at once the record of the fast engine, with fire-box resembling a hay car (in size), which it was announced a few months ago was being built, and which was expected to cover a mile in forty seconds: for its laurels are in danger of being carried off by a contemptible barrel-stave sliding-down-hill apparatus, referred to in the newspapers as follows:

"A civil engineer has timed the toboggans at the chute of the Ridgefield Athletic Club of Albany, and found that at the point of greatest speed they attained a velocity of a mile and a half a minute. The calculations were carefully made and were repeated again and again."

What is the country coming to if the efforts of thousands of brilliant railroaders for the past half century are thus to be brought to naught? It must not be; the engine must be brought to the scratch, and vindicate her claim to be called the king of space-annihilators. A sheet of paper must be pasted around her tires so as to bring their diameter up to the proper magnitude; nay more, she must have some 8 ft. wheels and then have the Fontaine engine loaded on top of the boiler, if necessary, rather than rest under this impending disgrace.

But then, there is really no just ground for comparison, so that a defeat, if sustained, could be borne without dishonor. Look at the difference in circumstances. Fuel costs next to nothing on a sled. One enthusiastic tobogganer the other day went so fast that his cigarette was fanned to a blaze and his mustache was annihilated—ruining his position in society, by the way; then again, young ladies are frequently given a "seat on the foot-board" as it were, and the glow of their cheeks is said to carry warmth to the heart of the driver if not to the vehicle itself. Sealskin sacques are said to be quite common; and of course they prevent radiation better than any asbestos jacketing ever heard of. No engine can compete with such tricks as these. Lubrication costs next to nothing; who ever heard of greasing a locomotive with water? We have it on good authority that the Albany concern spends less than .0001 ct. per thousand train miles for oil, waste and tallow; and yet greased lighting is said to be sticky as fly-paper in comparison with the smoothness with which their vehicles run. Permanent way is *almost* as cheap as dirt. We understand that not a single Fisher joint has been found necessary, a few occasional bumps being regarded as rather an advantage than otherwise. We can never settle the fisheries dispute with honor to ourselves so long as this importation from Canada menaces our rights and liberties.

A Porter's Presence of Mind.

A dispatch from Shelbyville, Ill., Feb. 15, says.

Near this city the east-bound passenger train on the Bee Line at about ten o'clock last night met with an accident which came near being a dreadful calamity, but for the presence of mind of the colored porter of the Pullman sleeper. The engine became disabled and a man was sent to signal a freight which was following, with orders to scatter torpedoes on the track to warn the approaching train, the heavy fog preventing light signals; but the down grade made it impossible for the freight train to stop. On it came, nearer and nearer, and when the porter heard the discharge of the torpedoes, fearing a catastrophe, he awoke his passengers, told them to leave the car, hastily snatched up some children and carried them out. No sooner was the car emptied of its human freight than the engine of the freight struck it, cutting it in two and severely injuring the nearest passenger coach. The freight engine was badly camaged. The passengers had all left the cars, and this fact alone prevented a terrible loss of life. The cars and engine were brought to this city to-day. Only one man was slightly injured by the wreck.

Better Wages for Coal Miners.

The Executive Committee of the coal companies in the Clearfield regions of Pennsylvania have posted a notice to their miners as follows: "Osceola Mills, Feb. 17, 1887.—On and after March 1, 1887, an advance in mining of five cents per gross ton of coal will be paid, payments as at present; or ten cents per gross ton of coal, payments once per month. No collections for check weighmen, and work of all kinds to be paid for according to prices fixed by the superintendent or foreman in charge, and the miner or employé doing the work: provided that a similar advance shall be made in the Cumberland and other competing regions."

TECHNICAL.

Locomotive Building.

The Hinkley Locomotive Co., Boston, are at work upon recent contracts, as follows: Ten engines for the Atchison, Topeka & Santa Fe, 1 Mogul for the Addison & North Pennsylvania, 3 18×24 Standards for the Fitchburg, 2 for the Hoosac Valley, 1 for the New London Northern, 20 ten-wheelers for the Chicago, Burlington & Northern, 5 Moguls and 4 double-enders for the Chicago & Eastern Illinois and are rebuilding 1 for the Troy & Boston.

The locomotives for the Chicago, Burlington & Northern are being constructed under the supervision of Mr. Bryan, Master Mechanic of the road, and those for the Chicago & Eastern Illinois are under the direction of Master Mechanic Allen Cooke, and will have the Cooke & Strong Automatic Bell Ringer.

The Mogul for the Addison & North Pennsylvania road will be equipped with the Eames driver brake.

As will be seen from the foregoing, the works are very busy, new men being rapidly employed, and no contracts are taken except for immediate *delivery*.

The Rhode Island Locomotive Works are building two 17 × 20 Forney engines for the Boston & Providence road.

This road is now negotiating for the purchase of several new passenger cars.

The Brooks Locomotive Works have an order for 20 Mogul engines from the Duluth, South Shore & Atlantic.

The Schenectady Locomotive Works during the past year have made extensive additions to their plant, largely increasing their capacity for production. Both foundry and forge have been enlarged, and a number of the latest improved tools added. The foundation for an addition, 100 ft. by 130 ft., to the boiler shop is already laid, only awaiting favorable weather for rapid completion. With this extension the boiler shop will be 100 ft. wide and 380 ft. long. This building is built of brick, with an iron and slate roof. A Morgan 15-ton traveling crane is now being built at Alliance, O., for use in this shop. The present product of the works is about twenty locomotives per month, and when the above extensions are completed they will turn out an engine a day. The engines built this month (February) are as follows: Four 20 in. × 26 in. Consolidations, weighing 126,000 lbs each, for the Colorado Midland. These engines have wagon-top boiler, 60 in. diameter, made of $\frac{7}{16}$ in. steel, and will carry 160 lbs. steam pressure. The engines will work on 210-ft. grades and 16° curves. Six 18 in. × 26 in. passenger engines have been completed for the Atchison, Topeka & Santa Fe; weight, 95,000 lbs. each. Three 18 in. × 24 in. passenger engines for the East Tennessee, Virginia & Georgia. Four standard 17 in. × 24 in. eight-wheel engines for the Fort Worth & Denver City, and one 16 in. × 24 in. passenger engine for the Walkill Valley.

Bridge Notes.

W. G. Coolidge & Co., of Chicago, have been awarded the contract for an iron lattice draw bridge, 290 feet, over the St. Croix River, on the line of the Minneapolis, Sault Ste. Marie & Atlantic; the contract for an iron draw bridge at Marseilles, Ill., on the Chicago, Rock Island & Pacific; all truss bridges on the Republic Branch road, and 3 spans on the Louisville, New Albany & Chicago.

Manufacturing and Business.

The Vulcan Iron Works, Toledo, O., have recently shipped five of their "giant" railroad excavators to Wisconsin: One to Ryan & McDonald, Rockford, Wis.; one to Upper & O'Connor, Rockford, Wis.; and one large and one small to Drake & Stratton, Brooklyn, Wis. They have recently made some valuable improvements in the machine. Over forty are now in use by railroad and mining companies.

The Wagner Car Door Co. has recently taken orders covering 200 cars for the Louisville & Nashville; 300 for East Tennessee, Virginia & Georgia; 400 for St. Louis, Arkansas & Texas; 1,075 for Newport News & Mississippi Valley; 700 cars for Buffalo, Rochester & Pittsburgh; 475 for Colorado Midland, 100 for Ohio River; 1,800 for Atchison, Topeka & Santa Fe; 300 for Southern Pacific Co.

During the night of Feb. 2 the extensive works of the Egan Co., Cincinnati, O., manufacturers of wood-working machinery, were partially destroyed by fire. About one-

third of the establishment, including their pattern shop and planer room, was burned. Fortunately very few of their patterns were in the building, otherwise the loss, while it is severe, would have been much heavier. The company will not be interfered with to any great extent in the transaction of business; all orders will be promptly filled.

The burned portion will immediately be rebuilt. In the meantime temporary warerooms have been secured in an adjacent building, and a double force of pattern makers will be at once put to work.

The Wainwright Manufacturing Co. of Boston has just issued a new catalogue containing elaborate cuts and descriptions of their feed water heaters, radiators, corrugated tubing, etc.

The Wason Manufacturing Co. at Brigntwood (Springfield), Mass., will build a new resawing mill 45 × 125 ft., and add about $10,000 worth of new machinery, having orders on hand to keep 500 men busy till Oct. 1, and being obliged at present to hire room for 30 wood-carvers outside their own premises.

The State of Texas, which is about completing its new capitol, will cover it with copper, using about 800 squares. The Cincinnati Corrugating Co., of Cincinnati, Ohio, has the contract for this copper roof, which will be, perhaps, the largest amount on a single building in the United States. The Minnesota Thrasher Co. has been organized. It is a Boston corporation and is said to control the credits of the Northwestern Car Co., of Stillwater, Minn., which went into a receiver's hands three years ago. The officers of the new company are D. B. Dewey, President; J. H. Bonvier, Vice-President; R. A. Kirk, Secretary, and T. A. Prince, Treasurer. Capital stock, $5,000,000.

Iron and Steel.

The wages of the employés of the Cambria Iron Works at Johnstown, Pa, have been advanced 10 to 15 per cent.

Gordon, Strobel & Laureau, of Philadelphia, have just made a contract with the Alabama Coal & Iron Co. of Sheffield, Ala., for two 18x75 furnaces, with all appurtenances, to be completed by May, 1888. They have also contracted with General Warner, of Tecumseh, Ala., for two 12x60 charcoal furnaces, to be built in Nashville, Tenn.

The Vulcan Iron Works, Chicago, have orders for 150 tons of curve castings for the North Chicago Cable road, an ice machine for the Consolidated Ice Machine Co., of Chicago, and a number of pile-drivers for different railway companies.

The Everett Furnace, of the Everett Iron Co., at Everett, Pa., will be offered for sale to the highest bidder on April 28 next.

The employés in the melting department of the steel works of Hussey, Howe & Co., Limited, at Pittsburgh, Pa., have been granted an advance of 20 per cent. in their wages.

The Stony Creek Iron Works, in Norristown, Pa., have been put in repair, and are now operated by Bertolet & Lukens, of Philadelphia.

The rolling mills of the Beaver Falls Iron Company at Beaver Falls, Pa., which have been shut down for several months for the purpose of putting in new machinery, have started up in full.

Messrs. King, Gilbert & Warner, who recently bought Moxahala Furnace, at Moxahala, O., are refitting the plant and expect to blow in some time this month. They have changed the name of the stack to Glasgow Furnace, and will use entirely new ores and different stock from what were formerly used at this furnace. The ores used will be Tuscarawas County black-band and Lake Superior; the fuel will consist of one-half coal and one-half coke. The firm intends to make a first-class black-band iron, which will be known as Glasgow American-Scotch iron.

The Clapp-Griffiths steel plant of the Spang Steel & Iron Co., Limited, of Pittsburgh, Pa., will be ready for work by March 1. It consists of two 3-ton converters, and its capacity will be about 50,000 tons per annum.

Heating Cars by Steam.

The *Railroad Gazette* of January 14 contained a statement, made by an officer of the Lake Shore & Michigan Southern Railroad, that a train of cars on that road was being equipped with the Emerson heater—a statement that was erroneous, in that it is the Martin anti-fire car heater, made at Dunkirk, N. Y., which is being placed in the Lake Shore cars. The New York Central & Hudson River Railroad Company are also placing the Martin heater in their cars.

Dump Cars.

Mr. John M. Goodwin, Sharpsville, Pa., writes: "I am building ten of my dump cars at Lorain, Ohio, for the Cleveland, Lorain & Wheeling road, and am putting up an 8-wheeler for a Missouri railroad. The four-wheel dump car now running on trial on the New York, Pennsylvania & Ohio road, hauling ore and furnace cinder, has, during its 3 weeks' service, made more ton-miles than any 20-ton 8-wheeler on the road."

Compressed Gas.

The Pintsch Lighting Company makes the following comparative statement of the number of railroad cars lighted by their compressed gas system at the end of 1883 and 1886:

Railroads in	1883.	1886	Increase.
Germany	7,889	14,720	6 831
England	1,286	3,218	1,932
France	530	1,541	1 011
Holland	463	609	146
Italy	12	21	9
Austria	338	754	416
Russia	448	600	152
Sweden	72	127	55
Denmark	....	15	15
Switzerland	137	210	73
United States	247	355	108
Total	11,422	22 170	10,748

The rapid progress made in introducing this lighting system in the German, English and French cars and the little progress made in this country is not explained in the company's statement.

The system requires the establishment of gas making and compressing plants at points where the cylinders under each car may be recharged at intervals of something like a week, and to this fact may be ascribed the hesitation to adopt the system in this country where the distances are greater, and cars are liable to go where there are no compressors established. It appears to be the only explanation of the fact that in this respect American railroad practice is certainly behind that of other countries.

The Whitner Automatic Appliances for Atmospheric Brakes.

The Whitner Automatic Brake Co., of New York City, offers a simple apparatus for automatically applying the air or vacuum brake, in its "frangible vent," which consists of a section of the main air pipe, made comparatively brittle, extended to the truck in such a way that a wabbling or broken wheel or a derailment will break it, and let out the air, of course applying the brake with full force at once. The composition of the pipe is such that any ordinary or trivial blow or compression will not fracture it, while at the same time it is so thin that any such thing as a loose wheel or the weight of a corner of a truck pressing it against the rail is expected to break it with unvarying certainty.

The company has also brought out a "bleeder" for the automatic air brake which, we understand, is being tried on the New York, New Haven & Hartford road with satisfactory results thus far. As is well known, slight disarrangements of the apparatus or miscalculations in using it frequently set the brakes in such a way that the readiest (if not the most logical) way of releasing them and enabling the train to be started is to empty the brake cylinders by going to each one and opening the cock by hand. This is an inconvenient operation and often involves considerable delay, as in the case of the Spuyten Duyvil collision, where it was one of the chief contributing causes of a great disaster. This automatic attachment, it is claimed, obviates this difficulty, and by a very simple mechanism provides for automatic bleeding in case of a bursted hose or similar sudden reduction of pressure, and at the same time leaves the brake under the complete control of the engineman as long as it is in its normal condition.

Cars for Sweden.

The Swedish and Norwegian Railway has just ordered one hundred iron-ore cars of 56,000 lbs. capacity of the Birmingham Wagon Co., of Smethwick, England. These cars will be fitted with the Westinghouse automatic brake.

Trade Improving in England.

The London *Engineer* states that it is not a bad indication of trade improvement that the men in the locomotive works of the Midland Railway Company at Derby are again working full time.

Oil on English Roads.

An English paper gives the annual consumption of oil upon the railways of the United Kingdom roughly as follows: Engineer's department, $150,000; locomotive department, running, $1,125,000; shops, $125,000; carriage lighting, $200,000. Traffic department, $200,000; general offices, etc., $50,000. Total estimated cost, $1,850,000; or, say, at 12 cents per gallon, 14,800,000 gallons a year. The average cost per train mile of "oil, tallow and waste" in the locomotive running expenses is 0.53 cent per train mile. Oil by itself may be taken at about two-fifths of one cent per train mile, which, on a fair aggregate mileage, would give the $1,125,000 above estimated as the cost in this department on all the lines.

The Electric Light.

Engineering states that there is good reason to believe that the electric light in the May Island light-house off the coast of Scotland has been seen at sea at a distance of 46 miles. Few light-houses are visible over 28 miles and then only under favorable circumstances.

Railroads in Turkey.

The junction of the Servian and Turkish railroad systems is nearly accomplished. Lines will shortly be finished connecting Belgrade *via* Vrania with Salonica, on the Mediterranean, and Bulgaria *via* Nisch and Sofia, with Constantinople. These lines will afford for the first time an all-rail communication between Constantinople and the European railroad system. During the first year two passenger trains per week will be run in each direction between Salonica and Belgrade.

English Railroad Dividends.

English railroad dividends just declared show generally a slight improvement on those made a year ago. Dividends on the common stock for the last half year of 1886 have just been declared at the following rates: Lancashire and Yorkshire, 4 per cent.; Taff Vale, 10 per cent. with 1 per cent. bonus; Great Northern, 5¾ per cent.; North London, 7½ per cent.; Great Western, 6½ per cent.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Cleveland, Columbus, Cincinnati & Indianapolis, annual meeting, at the office in Cleveland, Ohio, on March 2.

Missouri Pacific, annual meeting, at the office in St. Louis, March 8.

Peoria, Decatur & Evansville, annual meeting, at the office in Peoria, Ill., March 1.

Brunswick & Western, annual meeting, at the office in Brunswick, Ga., March 9.

Atlanta & Charlotte Air Line, meeting, at the office, New York, March 9.

St. Louis, Iron Mountain & Southern, annual meeting, at the office in St. Louis, Mo., March 8.

New Orleans & Northeastern, annual meeting, at the office in New Orleans, La., March 7.

Norfolk Southern, annual meeting, at the office in Elizabeth N. C., on March 3.

Pottsville & New York, special meeting of stockholders, at the office in Pottsville, Pa., March 1.

Schuylkill & Lehigh Valley, special meeting of stockholders, at the office in Pottsville, Pa., March 1.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *New York State Passenger Association* will hold a meeting in New York on Feb. 24.

The *Southern Railway and Steamship Association* will hold a convention at the National Hotel, Washington, D. C. on Wednesday, March 2.

The *National Association of General Passenger and Ticket Agents* will hold its half-yearly convention in Washington, on Tuesday, March 15.

The *General Time Convention* will hold its spring meeting in New York City, on Wednesday, April 13.

The *Car Accountants' Association* will hold its annual convention in Atlanta, Ga., beginning on Tuesday, April 19.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each mouth.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The *Association of North American Railroad Superintendents* will hold a meeting at the Hotel Brunswick, N. Y., on April 12.

Western Traffic Association.

On Feb. 23, at a Chicago meeting, it was decided to make the rate on corn from Omaha to Chicago 22 cents per 100 pounds, and on wheat 27 cents per 100 pounds, in each case 2 cents higher than the rates on the same articles agreed upon by the Southwestern Railway Association—between Kansas City and Chicago.

The rate on cattle was fixed at $70 per car from Omaha to Chicago, or $5 per car more than the rate from Kansas City to Chicago. On live hogs a rate of $60 per car, Omaha or Council Bluffs to Chicago, was established, against a rate of $55 per car from Kansas City to Chicago. The rate on packing-house products from Omaha or Council Bluffs to Chicago was made 5 cents per 100 pounds higher than the rate on packing-house products from Kansas City to Chicago.

New England Railroad Club.

The annual meeting of the New England Railroad Club is announced as follows:

Rooms, Boston & Albany Passenger Station, Boston, Mass. The fourth Annual Meeting of the Club will be held on Wednesday, March 9, 1887, at 7:30 p. m. Subject for discussion—"Lighting and Ventilating Cars in Passenger Services. "In this impetuous and enlightened age is not something more electric than the tallow candle and something more luminous than oil demanded?

The Treasurer will submit his report.

Officers for the ensuing year will be elected.

The question of electricity as a practical mechanical force is receiving the attention of some of the brightest intellects of to-day, and it is expected that the various methods for lighting cars by electricity which have been developed will be fully considered and ventilated at this time. Electricians and all others interested are cordially invited to be present and offer papers on the subject.

The subject of ventilation has been occasionally discussed, generally in a somnolent way, and why? Because usually the value of pure air is not correctly estimated. Those unable to be present are especially requested to send communications to the Secretary.

Central Iowa Traffic Association.

It is reported that the Chicago, Rock Island & Pacific is so greatly dissatisfied with the recent award of percentages for the Central Iowa Traffic Association that they threaten to withdraw from the pool, unless a rearbitration is had. The Chicago, St. Paul & Kansas City has given notice of its withdrawal from the pool, and that it will no longer be bound by the agreement.

This will probably cause the disruption of the association.

Joint Committee Meeting.

A meeting of the Joint Committee, composed of the Trunk Line Executive Committee and representatives of the eastern and western connections of the trunk lines, was held at Commissioner Fink's office in New York on Feb. 18. Representatives of some of the important Southern lines were also present. The object of the meeting was to consider what action was to be taken to make the tariffs conform to the provisions of the Inter-state Commerce law. The meeting formulated no general interpretation of the provisions of the law; but after a general discussion and interchange of views, the following resolutions were unanimously adopted:

Whereas, The Executive Committees of the Trunk Line Commission and of the Central Traffic Association, and other members of the Joint Committee, being convened in joint meeting for the consideration of the bearings of the law regulating interstate freight and passenger traffic upon the classifications, tariffs and methods of the Joint Committee, hereby adopt the following resolution:

Resolved, That the freight rates and classifications and the passenger fares of the railways comprising the Joint Committee be at once examined and be revised in all respects in which they are found not to conform to the law.

Resolved, That a Freight Committee, a Freight Classification Committee and a Passenger Committee be appointed by the Chairman to conduct the said revisions, and that each of said committees consider, formulate and recommend such amended rules and regulations as may be found required to secure the uniform application of the law to the subjects referred to them respectively.

Resolved, That it be the duty of said committees to confer with other associations within the territory of the Joint Committee, to secure uniformity in tariffs, classifications and rules; and the railways of the Joint Committee are requested to instruct their representatives in said associations to that effect.

Resolved, That said committees report their recommendations as speedily and fully as practicable to the Joint Committee, which shall then be promptly convened to consider and act upon the same.

Ohio River Passenger Pool.

A meeting of the General Passenger Agents of the Ohio River pool lines was held at Chicago on Feb. 18, for the purpose of investigating charges concerning cutting of passenger fares; it being claimed that the business was badly demoralized. The charges were referred to Commissioner Richardson for investigation, with instructions that the penalties provided by the pool agreement be inflicted on all roads found guilty of violating the agreement.

Arranging Tariffs.

The General Passenger Agents of the Southwestern, Northwestern and Western Associations held meetings at Chicago last week, and formulated rules for the conduct of passenger traffic in compliance with the Interstate Commerce law, and prepared a report upon the subject for submission to the general managers.

The General Freight Agents of the Southwestern Railway, Western Traffic and Northwestern Freight Associations also met to arrange rates in accordance with the new law.

ELECTIONS AND APPOINTMENTS.

Augusta & Chattanooga.—At the meeting held in Augusta, Ga., Gen. C. A. Evans was re-elected President of this company.

Augusta, Gibson & Sandersville.—At the annual meeting in Augusta, Ga., the following directors were elected: R. M. Mitchell, W. B. Young, Chas. H. Howard, W. T. Gary, N. W. Murphey, W. J. Pollard, Augusta, Ga.; Thomas Warthen, Warthen; Jas. K. Hines, Sandersville, Ga.; James J. Davis, Hepzibah; Joshua A. Smith, Noah, Ga.; Jas. Stapleton, Stapleton, Ga.; Jno. B. Williams, Gibson, Ga.; Geo. W. Stetson, New York. Mr. R. M. Mitchell was chosen President.

Baltimore & Ohio.—Mr. M. W. Maguire has been appointed Train Master of the Curtis Bay, Washington, Alexandria & Metropolitan branches, with headquarters at Baltimore.

Birmingham, Georgia & Florida.—The incorporators are J. A. Montgomery, William M. Burthea and E. P. Earle, of Birmingham, Ala., and W. H. Skaggs and D. M. Rogers, of Talladega.

Cape Breton.—J. W. Heckman has been appointed Resident Engineer of this road, which is now being built across the Island of Cape Breton.

Cincinnati, Indianapolis, St. Louis & Chicago.—Mr. J. Pierpont Morgan, of New York, has been elected to a vacancy in the directory caused by the resignation of B. T. Evans, of Cincinnati.

Cincinnati, New Orleans & Texas Pacific.—At the meeting in Cincinnati the following directors were elected: Augustus Wessel, F. S. Bond, F. Schiff, T. T. Gaff, W. A. Goodman, A. T. Harvey, Briggs Swift, and Alex. McDonald.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. W. J. Nichols is General Western Passenger Agent, with office at St. Louis, Mo., vice D. B. Martin, promoted.

Mr. T. C. Peck is District Passenger Agent at Indianapolis, vice W. J. Nichols, promoted.

Delaware, Lackawanna & Western.—At the annual meeting in New York these managers were elected: John I. Blair, George Bliss, Percy R. Pyne, Wilson G. Hunt, Elias S. Higgins, Benjamin G. Clarke, Jay Gould, Sidney Dillon, Russell Sage, Edgar S. Auchencloss, Andrew T. McClintock, Gardner R. Colby, William H. Appleton and W. W. Astor.

Samuel Sloan was re-elected President. Other officers: Frederick F. Chambers, Secretary; Frederick H. Gibbens, Treasurer.

Detroit, Charlevoix & Escanaba.—The directors are: S. G. Isaman, of South Arm, Mich.; R. M. Cherrie and A. E. Lewis of Ironton, Mich.; H. D. Bartholomew, F. J. Meech, E. H. Green, John Nichols, D. C. Nettleton, A. D. Cruickshanks, J. Milo Eaton and G. W. Crouter, of Charlevoix, Mich.

Fort Smith & El Paso.—The incorporators are W. H. H. Clayton, James Buzzolara, W. M. Fishback, Elias C. Boudinot, of Fort Smith; J. J. McAllister, I. T. McAllister, D. M. Hailey and E. P. Harris, of Savanna, Indian Territory.

Kansas City, Memphis & Birmingham.—The officers are: George H. Nettleton, President and General Manager, Kansas City, Mo.; Charles Merriam, Treasurer, Boston, Mass.; R. H. Elliott, Chief Engineer, Birmingham, Ala.; J. S. Ford, Secretary and Comptroller, Wallace Pratt, General Attorney, Kansas City, Mo.; Jno. H. Sullivan, Superintendent, Memphis, Tenn.; M. L. Sargent, General Freight Agent, J. E. Lockwood, General Passenger and Ticket Agent, H. P. Jacques, Purchasing Agent, B. L. Winchell, Assistant General Passenger and Ticket Agent, S. M. Hibbard, General Baggage Agent, at Kansas City, Mo.; H. D. Ellis, General Agent, Chas. Jones, Southern Passenger Agent, F. E. Scott, City Passenger Agent, at Memphis, Tenn.

Lehigh Coal & Navigation Co.—The election at the annual meeting resulted as follows: Joseph S. Harris, President; Francis C. Yarnall, Vice-President; Edward W. Clarke, Francis R. Cope, Fisher Hazard, Charles Parrish, James M. Wilcox, Edward Lewis, T. C. Henry, Samuel Dickson, Edward R. Leisenring, Abram S. Hewitt.

Mexican Central.—Mr. A. C. Michaelis is General Freight and Passenger Agent, with headquarters at the City of Mexico. Mr. Geo. W. Keeler will continue as General Eastern Agent, with office at 261 Broadway, N. Y.

Mexican National.—The directors are: William M. Spackman, William W. Nevin, John Pratt, Allen W. Evarts, Charles W. Drake, Chas. C. Braman, Prescott Hall Butler, J. Evarts Tracy, Treadwell Cleveland, Lyman K. Bass, Theodore H. Friend, Walter Hinchman and Theodore F. H. Meyer.

Minnesota & Northwestern.—Mr. W. L. Hanson has been appointed Superintendent of Chicago Divison.

Missouri Central.—At a directors' meeting in St. Louis, Mo., last week the following officers were elected: President, John D. Perry; Vice-President, George W. Parker; Secretary and Treasurer, M. H. Hawes. An Executive Committee was elected, composed of John D. Perry, Stevenson Burke, Frank C. Hallis, J. T. K. Hayward and D. M. Henderson.

Nebraska & Western.—The incorporators of this proposed road in Nebraska are: Ovand J. Hollister, M. W. Kaigh, John I. Packard, Donald McLean and James D. Negress.

New York, New Haven & Hartford.—Mr. Joseph Schofield, formerly a conductor, and who at present has charge of the trains at the Grand Central Station, New York, has been appointed Superintendent of the New York Division, to succeed W. H. Stevenson, resigned.

Philadelphia & Reading.—Mr. Charles M. Heald has been appointed Assistant to the General Manager.

Poughkeepsie & Delaware.—Among the directors are John Greenhough, Henry R. Low, Peter E. Farnum, Charles St. John, Obadiah P. Howell and Wade Buckley.

Providence & Worcester.—Charles Howard has been elected Superintendent in place of W. E. Chamberlain, resigned.

Schuylkill & Lehigh Valley.—The directors of the consolidated company formed by the above and the Pottsville & New York are E. N. Frisbee, New Jersey; Moses E. Woltbern, A. F. Rice, New York; James S. Thurston, Joseph W. Moyer, Pottsville, Pa.; J. R. Clayhorn, Philadelphia; Thos. Foster, of Mauch Chunk, Pa.; Noble N. Betz, of Towanda; Mr. Smith, of Elmira, N. Y.; Fredk. A. Sawyer. Officers: E. N. Frisbee, President; Moses E. Woltbern, Vice-President; A. F. Rice, Secretary; James S. Thurston, Treasurer.

Tennessee Midland.—The officers are A. S. Buford, President; W. D. Bethal, Secretary and Treasurer; T. C. Leake, Jr., Vice-President; R. H. Temple, Engineer. Principal office is temporarily at Memphis, Tenn.

Union Pacific.—Mr. W. T. Holly has been appointed City Passenger Agent at Chicago, vice Mr. M. T. Case, resigned.

Western Colorado Railway Association.—Mr. George H. Daniels has been elected Arbitrator to fix percentages for the Colorado roads west of Denver.

PERSONAL.

—H. E. Pitcher, General Freight and Passenger Agent of the Toledo, Columbus & Southern, has resigned.

—Mr. S. N. Aldrich of Marlboro, Mass., President of the Central Massachusetts, has been appointed United States Sub-Treasurer at Boston, to succeed Mr. M. P. Kennard.

—Solomon Jones, Chief Train Dispatcher of the Northern Central road, died last week at his home in Elmira, N. Y. He was 57 years old, and had passed his life in the railroad business.

—Mr. John Heebner has been compelled to resign his position as Auditor of traffic receipts in the office of the Philadelphia & Reading at Philadelphia, owing to continued ill health. Mr. Geo. Zeigler succeeds him.

—Expert H. M. Thompson, of the New York State Railroad Commission office, has resigned his position to become Secretary and Treasurer of the Brooklyn City Railroad. Mr. Thompson was General Accountant of the New York, Pennsylvania & Ohio for ten years, and inaugurated a new system of railroad accounts and a new form of reports for all railroads in New York state, which were adopted by the board two years ago and are now in use.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of January:

	1887.	1886.	Inc. or Dec.	P. c.
Chic. & N. W.	$1,723,173	$1,328,107	I. $395,066	29 7
Den. & R. G. W.	71,250	66 970	I. 4,280	6.3
Col. & Rome	7 666	4,874	I. 2 792	56 9
Georgia Pacific	96,310	58 395	I. 37,915	64.9
Illinois Central	1,040,444	868,229	I. 172,215	19.8
Miss. & Tenn.	45,587	30,836	I. 14,751	47.8
Nash., C. & St. L.	242,094	185,519	I. 56,575	30.4

Month of December.

	1886.	1885.		
Cleve. & Canton	$29,196	$26,483	I. $2.713	10.2
Dan. & Northern	17,311	16 693	I. 618	3.7
Fla. Ry. & N.	122,022	112 415	I. 9,607	8.5
Jack., T. & K. W.	52,103	14,438	I. 37,665	261.5
Lykens V.	62.481	67.001	D. 4.520	6.7
Northern Central	457,809	507,699	D. 49.890	9.6
Phila. & Erie	301.174	279,429	I. 21.745	7.7
Scioto Valley	61,036	56,012	I. 5,024	8.9
South Carolina	97,430	122,509	D. 25,079	20 4
Summit Branch	103,906	111,170	D. 7,264	6.5

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

Coal.

Coal tonnages for the week ending Feb. 19 are reported as follows:

	1887.	1886.	Inc. or Dec.	P.c.
Anthracite	638,324	586 063	I. 52,261	8.9
Eastern bituminous	288,522	217,709	I. 70,813	32.5
Coke	96,106	28,148	I. 67,958	276.9

Cumberland coal shipments for the week ending Feb. 19 were 61,945 tons; total to Feb. 19 this year, 360,774; last year, 259,361; increase, 101,413, or 39.1 per cent.

The coal tonnage of the Pennsylvania Railroad for the week ending Feb. 12 was:

	Coal.	Coke.	Total.	1886.
Line of road	162,610	94,628	257,238	187.437
From other lines	97,299	1,478	98,777	91,392
Total	259.909	96,106	356,015	278,829
Year to Feb. 19	1,536,199	541,071	2,077,270	1,659,579

Increase for the week, 77,186 tons, or 27.7 per cent.; increase for the year, 417,691 tons, or 25.1 per cent.

Anthracite Coal Tonnage.

The statement of anthracite coal tonnage for January, issued by Mr. John H. Jones, the Official Accountant, was as follows, the statement including the entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines:

	1887.	1886.	Inc. or Dec.	P.c.
Phila. & Reading	500,391	700,173	D. 199,782	28.5
Central of N. J.	237,633	.....	I. 237,633	....
Lehigh Valley	409,633	446,497	D. 36,864	8.2
Del., Lack. & West	350 236	496 760	D. 146,524	29.3
Del. & Hud. Canal Co.	355,641	313,086	I. 42.555	13.6
Pennsylvania Railroad	253,505	232 522	I. 20,983	8.1
Pennsylvania Coal Co.	79,233	83,586	D. 4,353	5.2
N. Y., L. E. & W.	57,041	65,648	D. 8,606	13.1
Total	2,243,313	2,338,271	D. 94,958	4 0

New Jersey Central tonnage in 1886 was included in of Philadelphia & Reading.

The stock of coal on hand at tidewater shipping points, Jan. 31, 1887, was 475,448 tons; on Dec. 31, 1886, 372,282 tons, increase, 103,166 tons, or 27.1 per cent.

Cotton.

Cotton movement for the week ending Feb. 18 is reported as below, in bales:

Interior markets:	1887.	1886.	Inc. or Dec.	P. c.
Receipts	59 963	57,853	I. 2,110	3 6
Shipments	71,395	63,799	I. 7,596	11 9
Stock, Feb. 18	321,366	448,170	D. 126,804	28.0
Seaports:				
Receipts	86,582	102,524	D. 15,942	15.0
Exports	101,878	85,524	I. 16.354	19.2
Stock, Feb. 18	872,805	1,042,354	D. 169,549	16.2

The total receipts from plantations for the crop year ending Feb. 18 was 5,731,747 bales, against 5,599,499 last year, 5,143,216 in 1884–85, and 5,063,696 in 1883–84.

OLD AND NEW ROADS.

Americus, Preston & Lumpkin.—The directors have decided to build an extension from Antioch, Ga., to Columbus, a distance of 25 miles.

Arkansas & Southern.—This company has been organized at Little Rock, Ark., to build from Louisville, Ark., to Shreveport, La., a distance of about 100 miles. The St. Louis, Arkansas & Texas Railroad Co., will direct the building of the new road.

Augusta & Chattanooga.—At a stockholders' meeting held in Augusta, Ga., the directors were authorized to issue bonds not exceeding $20,000 per mile and to make such arrangements as may be necessary to proceed with the building of the road. Men are now at work on the grading.

The engineers are near Point Peter, Oglethorpe County, Ga., having run three routes out of Augusta.

Baltimore & Ohio.—There seems no likelihood of the road getting any accommodation over the Philadelphia & Reading tracks from Philadelphia to New York.

Bangor & Piscataquis.—The directors have decided to have a road surveyed and located from Milo to Bangor, Me., through Kenduskeag, Corinth and Charlestown. The line is expected to be finished this year.

Binghamton & Williamsport.—The line is now located from Binghamton, N. Y., to Wyalusing, and is now ready for construction work.

Birmingham, Georgia & Florida.—Incorporated to build a road from Birmingham, Ala., to Columbus, Ga. Capital stock, $4,000,000.

Boston & Albany.—The Massachusetts State Railroad Commissioners, in their report on the petition of citizens for better station facilities at Springfield, recommend that the platforms be divided lengthwise by fences, and that an overhead passage be provided so that passengers may not be allowed to cross the tracks. They say that the platform sheds at the west end of the station should give better protection from the weather and virtually recommend the extension of the whole station at the west end so as to obviate the necessity of stopping trains on Main street, and of crossing it in making up trains and switching. They add that the gates at the street crossing should be positive barriers instead of mere warnings, and recommend that these changes be carried out at once. But in a sort of appendix to the report, which is really its most important part, they say that any improvement of the present station or amelioration of its evils will be only temporary at best, and that a new station east of Main street should be at once provided.

Boston & Maine.—It is rumored that the Providence & Worcester road is to be leased so as to obtain a through line from Portland and the provinces to Long Island Sound, and thence by boat to New York.

Buffalo, New York & Philadelphia.—This company's roundhouse and six locomotives at Olean, N. Y., were consumed by fire on Feb. 20. Loss, $35,000.

Canadian Pacific.—It is stated that this company will purchase three of the fastest steamships of the Cunard Line and put them on the British Columbia and Australian route in the spring.

Central, of New Jersey.—The assertion is made that Mr. Austin Corbin has secured a controlling interest in the stock, extending, it is said, to 184,000 shares.

Chesapeake.—The road is to run from a point near Norfolk, Va., to some suitable point on the line between Virginia and North Carolina, where the Roanoke River crosses. Four miles of roadway have been completed and the company is now engaged in further construction.

Chicago, Burlington & Quincy.—The suit against the stockholders of the Kansas Rolling Mill Co. has been decided in favor of the railroad company. The suit involved $225,000. The main issue was the test of the individual liability of those stockholders who were executors of the estate of Amasa Stone.

The Secretary of the Interior has notified this company that it will be allowed 60 days to show cause why legal proceedings should not be instituted to recover lands patented to the Burlington & Missouri River Railroad Co. in Nebraska. Over 200,000 acres of land are involved.

Chicago, Madison & Northern.—This new line of the Illinois Central is now ready for the rails from Freeport, Ill., to Monroe, Wis., 25 miles.

Chicago, Rock Island & Pacific.—This company will build car shops at Davenport, Ia., the citizens of that place having donated a valuable building site.

Chicago, Santa Fe & California.—This company has purchased and is operating the Chicago & St. Louis, which runs from Chicago to Pekin, via Streator Ill. Work on the new line from Streator to Fort Madison, Ia., continues.

Chicago, St. Paul & Kansas City.—This extension of the Minnesota & Northwestern is located to within a short distance of St. Joseph, Mo. The contract is let to Shepard Winston & Co., of St. Paul, Minn. The road is in operation from Waterloo to Des Moines, Ia.

Cincinnati, Hamilton & Dayton.—A link will be built from Dayton, Ohio, 26 miles west to Eaton, thence to Richmond, Ind., and to Anderson, where it will connect with the Chicago, Wisconsin & Minnesota.

Cincinnati, Indianapolis, St. Louis & Chicago.—At a meeting in Cincinnati a resolution was adopted by the directory providing for the sale, to stockholders of record on March 18, the $3,000,000 of stock, the issue of which was authorized at the last annual meeting. Stock is to be sold at par, less credits of dividends earned but not declared to the amount of 3½ per cent. A million dollars of the proceeds will be used in refunding the present bonded indebtedness in new gold 4 per cents., running 50 years. Remainder of proceeds to go into treasury. The stock of the road has advanced sharply of late. A large proportion of Cincinnati holdings has been sold in New York on account of the County Auditor's decision that the stock is taxable in Hamilton County, Ohio.

Cincinnati, Jackson & Mackinaw.—The road is to be extended from Cecil, O., to a connection with the Michigan & Ohio, about 80 miles. The contract for construction is let.

Cleveland, Akron & Columbus.—Sealed proposals will be received at the office in Akron, O., up to March 25 for the work necessary to complete the Dresden Branch, which extends from Killbuck to Dresden. Approximate quantities: 300,000 cubic yds. earth and rock excavation; 22,000 cubic yds. tunnel excavation, 8,000 cubic yds. masonry, 35 miles of tracklaying and ballasting, 30 miles of fencing. Information will be given by the Chief Engineer, at Akron

Connecticut Central.—A decision in favor of this company has been handed down in the case involving the foreclosure of the road between Hartford, Conn., and Springfield, Mass., by the New York & New England holders of first-mortgage bonds. The stockholders of the Connecticut Central claimed in the court below that there should be an accounting by the New York & New England, which leases the road, and that such accounting would show that the profits were sufficient to pay the interest on the bonds. The court below, however, gave judgment for the New York & New England, and a decree of absolute foreclosure. This decree is set aside and a new trial ordered. The Supreme Court decision finds nothing unreasonable in the demand for an accounting.

Dansville & Hazelton.—A movement is under way for an extension eastward up the Delaware River to Port Jervis, N. Y., so as to make connection with roads that will utilize the new Poughkeepsie Bridge for New England traffic.

Duluth, South Shore & Atlantic.—The plan for building the road includes the bridging of the St. Lawrence at Brockville, Ont., and the construction of a new line from that point to Rotterdam Junction, N. Y., and a junction made with the Boston, Hoosac Tunnel & Western for New England, and with the West Shore for New York.

Fitchburg.—State Treasurer Beard, of Massachusetts, has been heard by the Committee on the Hoosac Tunnel and Troy & Greenfield road on the petition made for the appointment of three state directors for its consolidated road and for exemption from issuing mortgage bonds. He argued that if the bonds were issued without a mortgage, with the interest which the state has, it would seem that if it was better for the corporation it would be better also for the state. The only advantage that would seem to accrue to a mortgage would be the right, in default of interest, to foreclose, but the Commonwealth would be the minority in that foreclosure, the same as it will be in the board of directors, having only $5,000,000 out of $12,000,000.

Mr. Young, counsel for the Fitchburg road, said that the governor and council might vote upon the state's stock at the stockholders' meetings, and that, under a mortgage, a majority of the bonds might be owned by New York parties.

Senator Pillsbury, the Chairman of the committee, gave as Attorney General Sherman's views, as expressed to him, that "he had failed to find anybody who could show him wherein the State would be benefited by the issue of a mortgage."

Fort Smith & El Paso.—Incorporated in Arkansas to build a road from Fort Smith, in Sebastian County, 80 miles westward.

Fort Worth Western.—The survey is located to Throckmorton, Tex., 120 miles out from Fort Worth.

Gulf, Colorado & Santa Fe.—Grading is nearly finished between Ladonia and Paris, Tex., and the track will reach the latter point about April 1. Messrs. Ricker, Lee & Co., of Galveston, are the contractors for the work.

The Indian Territory extension is now in operation between Fort Worth and Gainesville. Track has been laid 35 miles north of Gainesville. Morgan Jones, of Fort Worth, Tex., is contractor for this work.

The track is now laid 40 miles beyond Red River in the Indian Territory.

Kansas City, Memphis & Birmingham.—This Mississippi and Tennessee Company, which had previously become the owner of all the railroad and other property of the Memphis, Birmingham & Atlantic Railroad Co., having been consolidated on the first day of February, 1887, with the Memphis & Birmingham Railroad Co., of Alabama, under the above name, the railroad and other property heretofore belonging to each of said companies will now be operated by the consolidated company.

Kentucky Central.—The Master Commissioner's sale will take place at Lexington, Ky., on April 7 next. The road extends from Covington, Ky., to Livingston, Ky., 150 miles, with branches of 103 miles, a total of 253 miles.

Kansas & Gulf Short Line.—Mr. S. B. Elkins, of New York, has purchased the road, and the papers have been signed. Road runs from Tyler, Texas, to Lufkin, 90 miles. The purchase was made in the interest of the St. Louis, Arkansas & Texas, but the latter company will not take formal possession until the road is changed from narrow to standard guage.

Lake Erie & Western.—The road is to be extended from Bloomington, Ill., to Peoria, about 37 miles.

Lebanon, Hunter's Point & Nashville.—This proposed road is to run from Lebanon, Tenn., north to the Cumberland River, 6 miles, thence down the centre of the river to Nashville. The tracks are to be laid on pontoons placed in the river!!

Lehigh Coal & Navigation Co.—President Harris says in his annual report that a charter for the Wilkes-Barre & Scranton road has been procured and also terminal grounds for depot in Scranton, Pa.; that 4 miles will be built from the Scranton terminus toward Union Junction, a contract having been made with the Delaware & Hudson Canal Co. for the use of the Union railroad from the joint of connection with it near Minooka Station to Union Junction. The road is expected to be completed to Scranton this year.

Little Falls, Dolgeville & Piseco Lake.—Rodney S. Whitman has been discharged from the Receivership, and the accounts have been closed. The assets paid about 7½ cents on the dollar to stockholders.

Little Rock & Eastern.—This company has been organized at Little Rock, Ark., to build a road from Altheimer, Jefferson County, Ark., northwestward to Little Rock, a distance of about 50 miles. It will be built under the direction of the St. Louis, Arkansas & Texas Railroad Co.

Louisville, Evansville & St. Louis.—A new connection is expected to be built between Rockport, Ind., and Owensborough, Ky., about 13 miles. Trains will have to be ferried across the Ohio River

Mexican National.—A special dispatch fram Monterey, Mexico, contains the following: Hon. Ramon Trevino, attorney for the Mexican National Railroad, arrived from Laredo this evening, and said that the Palmer-Sullivan syndicate had purchased the Jay Gould Railway, in New Laredo, Mexico, and all the papers had been signed in Laredo, Texas. The property purchased consists of twelve blocks of ground, two large two-story frame buildings, one depot and warehouse and 1,800 metres of railroad completed, and a large quantity of railroad material on the ground. They also purchased a half interest in the iron bridge across the Rio Grande, and they expect to commence work on it next week. Engineers will have surveys ready by March 1 to let the grading from Saltillo to San Luis Potosi; and, barring accidents, the city of Laredo will be bound by iron bands to the City of Mexico by May 1, 1888.

Incorporation articles have been filed in Denver, Col. This is a reorganization of the Mexican National Railway Co., and proposes to succeed to the property of that road and the Inter-Oceanic line from the City of Mexico to New Laredo, and several other branch lines in connection with the Mexican National system. The new company will have an office at Colorado Springs. Capital stock is placed at $33,350,000.

Michigan Central.—The company proposes to build a bridge across the river between Detroit and Windsor, Mich., 2,600 feet long, with two draw spans and one 400 ft. span, the latter to be removed each summer.

Milwaukee & Northern.—This road is being extended from Pike, Wis., to Champion, Marquette County, Mich., 50 miles, and will connect there with the Marquette, Houghton & Ontonagon road, and will cross the Marquette iron range.

This company has filed amended articles at Madison, Wis., increasing the capital stock from $2,200,000 to $8,000,000.

Missouri Central.—The Executive Committee, chosen at a directors' meeting held in St. Louis, Mo., last week, was authorized to make contracts for construction, and work will begin from St. Louis by March 1.

Missouri, Kansas & Texas.—At a meeting of scripholders last week the committee recently appointed to confer with Mr. Jay Gould reported that he had declined to modify his first proposal for a settlement, which was 60 per cent. in the company's general 5 per cent. bonds and 40 per cent. in the scrip of the Galveston, Houston & Texas Co. But Mr. Gould did modify the proposition later by agreeing to pay $200,000 in cash, to be distributed among the scripholders, and to also buy a half million of the Galveston, Houston & Texas bonds at 80 per cent. This gives the scripholders about 90¼ per cent. instead of their original demand for par and interest. The amount of scrip outstanding is said to be nearly $3,000,000.

Missouri Pacific.—This company now operates the Denver, Memphis & Atlantic road, which extends from Chetopa, Lambeth County, Kan., and runs westward to Sedan, in Chautauqua County, a distance of 84 miles. The stations are Bartlett, Elm, Edna, Valeda, Coffeyville, Tyrone, Caney, Nicoto, Peru Junction, Sedan. Mr. B. F. Drake, Superintendent of the Missouri Pacific, will have charge of the line.

New Albany & Vincennes.—Survey of line is now being made. The route extends from New Albany, Ind., westward to Vincennes, about 95 miles.

Nebraska & Western.—This company has filed articles of incorporation at Omaha, Neb. The line in Nebraska is to cross the northern half of the State from Covington, on the Missouri, opposite Sioux City, to a point on the western boundary of the State between the 42d and 43d parallels of latitude. Capital stock is $6,000,000.

New York, Chicago & St. Louis.—A petition filed in the Superior Court at Chicago by William Armstrong in behalf of the minority stockholders, alleges that the contractors, Brown, Howard & Co., of Chicago, have cleared nearly $4,000,000 while acting as directors and in the construction of the road, which did not properly belong to them. A net profit of $2,700,000 from the sale of first-mortgage bonds is said to have been divided among the members of the firm. It is alleged that the capital stock was issued without any consideration whatever, and that the second mortgage of $10,000,000 is properly the property of the Nickel Plate road, but that most of the bonds are in the possession of the defendants. The petition prays for an order against Receiver D. W. Caldwell to show cause why he should not be required to institute proceedings to recover for the benefit of the stockholders the various sums of money which have been misappropriated, and if he fails to take such action to substitute some other person as Receiver.

Judge Williamson, representing the company, and Sherman, representing the first mortgage bondholders, have secured an order in each of the auxiliary suits in Illinois and Indiana, directing Receiver Caldwell to issue certificates of indebtedness for $3,433,968 in payment for the rolling stock and equipment.

New York & New England.—Arrangements are in progress for a branch of the Springfield division from Melrose, Conn., to Warehouse Point, 3 miles. It will be done for the benefit of the manufacturers at Windsor Locks, which is opposite Warehouse Point, on the Connecticut River.

New York, New Haven & Hartford.—The new bridge across the Connecticut River at Lyme will cost about $400,000. But one track will run over it, though the piers are to be placed wide enough for two tracks should they ever be needed. The company has laid before the special commission plans for the elevation of the tracks at the Asylum street crossing in Hartford, Conn. The New York & New England tracks are also included in this scheme, and the two companies will bear the cost of half the work and the city of Hartford the other half. The cost is estimated at $250,000. The building of a new station in Hartford is also contemplated, to cost at least $100,000.

The two additional tracks being built from New Rochelle, N. Y., eastward, will be extended as far as Mamaroneck the coming summer. Each grade crossing is to be abolished as it is met.

Northern Adirondack.—This company has contracted for 300 freight cars and expects to buy 200 more before spring opens.

Northern Pacific.—This company is to have a weekly line of steamships running between Tacoma, Washington Ter., and Alaska during the season from April to October. The steamship Olympia, built several years ago by John Roach & Sons, of Chester, has been chartered for the service.

Ohio & Northwestern.—This company was organized for the purpose of building a road from Point Pleasant, W. Va., to Cincinnati, on the Ohio side of the river in connection with the Ohio Valley road on the West Virginia side, which has just been opened to Wheeling. The latter road will be extended to Pomeroy, thus connecting Pittsburgh with an entirely new section of the country. The company has already purchased the Cincinnati & Eastern and Cincinnati & Portsmouth roads, and both are being thoroughly reconstructed. The 53 miles between Gallipolis and Portsmouth will be completed by August. Among the Eastern people interested are James G. Blaine, William Walter Phelps, Norman Miller, D. O. Mills, George West, Wharton Barker, and others.

The question of contract letting was under discussion in Pittsburgh this week.

Ohio River & Lake Erie.—It is reported that this unfinished road has been sold to a syndicate of bondholders of the West Pennsylvania and the Shenango & Allegheny Valley. Also that a contract has been made with the New York, Chicago & St. Louis, by which, with the new acquirement, Pittsburgh and Erie will be connected by a short line competing with the Pennsylvania. Sarah Reed, of Erie, Pa., was the former owner of the Ohio River & Lake Erie.

Orange Belt.—The road is completed from Monroe Station on the Jacksonville, Tampa & Key West on Lake Monroe, to Oakland on Lake Apopka, 34 miles. Work is progressing toward Point Pinnellas on the Gulf. An issue of $170,000 first-mortgage bonds has been made, which is at the rate of $5,000 per mile.

Oregon Pacific.—The road, as proposed, is from Yaquina Bay on the Oregon coast to Boise City, Idaho, over 500 miles. It is completed from Yaquina to Albany, a distance of 83 miles. From Albany east to Santiam the roadbed is graded and tied, ready for the track. From Santiam the road is cross-sectioned for 30 miles. At the summit of the Cascade Mountains, a rock-working party of 200 men has been engaged for the past six months, and has made a big cut. In the mountain division the road has been cross-sectioned for 20 miles, as have also 65 miles between the mountain and Snake River. The plan is to complete the road to Boise City, Idaho, by the end of next year, and then to connect it with the Chicago & Northwestern.

Pennsylvania.—The dispute of this company with the Lake Shore & Michigan Southern over tracks and land near Erie, Pa., has assumed a somewhat grave aspect. It had been referred to a master, and while the Pennsylvania people were off their guard a large force of men belonging to the Lake Shore & Michigan Southern went into the former company's coal lines, tore up their track and substituted another of their own. A contest is anticipated.

This company has completed a survey for a new branch road from Peter's Creek, Pa., on the Pittsburgh, Virginia & Charleston, to McDonald's Station, on the Pittsburgh, Cincinnati & St. Louis, 18 miles from Pittsburgh. The line will be 28 miles long, and will open up a large area of coal country.

Pennsylvania, Slatington & New England.—The road is to be sold at Newton, N. J., on April 20. It is incompleted, and is laid out to run from Harrisburg, Pa., to Poughkeepsie, N. Y., 190 miles. The complainant is the Metropolitan Trust Co., of New York. The terms of the sale are that at least $30,000 must be paid in cash.

Philadelphia & Reading.—The committee having charge of the Whelan plan of reorganization announces that the plan has not received assents enough to carry it into effect. An appeal will be taken to the Supreme Court from the Master's report in regard to the priority of liens when it is finally confirmed by the Circuit Court.

Pittsburgh, Painesville & Fairport.—The survey for a proposed branch to extend from Middlefield, Geauga County, O., to Windsor, in Ashtabula County, 8 miles, has been completed.

Poughkeepsie & Delaware.—This company has been organized in the interest of the New York, Ontario & Western, so that, if the Poughkeepsie bridge is completed, a connection may be made with the new territory opened. But until completion of said bridge no active steps of construction are likely to be taken.

Redstone Coal & Coke Co.—Organized at Pittsburgh, Pa., for operating in the Connellsville region. The organization owns 4,000 acres of coal land. Work on the new plant will soon begin. It will be located on Redstone Creek, near Uniontown, Pa. A large number of coke ovens will be built.

Richmond & West Point Terminal.—The rumor current to the effect that the Louisville & Nashville had sold its interest in the Nashville, Chattanooga & St. Louis to the Richmond & Danville is denied by the head officials of the Louisville & Nashville.

The company will build a Union passenger station at Atlanta, Ga., at an expense of $200,000.

Rumford Falls & Buckfield.—It is reported that this road, running from Mechanics' Falls Junction, Me., to Gilbertville, Me., 27 miles, is to be sold or leased to the Grand Trunk.

St. Paul & Duluth.—The contract for the construction of the new bridge over the St. Louis River between Oneota and West Superior has been let, the stone work to E. J. Kirkland, of St. Paul, Minn., and the superstructure to the Morse Bridge Co., of Youngstown, O. It is to be finished, with its 1⅝ miles of approaches, by June 1.

San Antonio & Aransas Pass.—Fourteen miles of iron rails have been laid on the Northwestern extension from San Antonio, Tex., toward Kerrville, and it is thought that Boerne, 30 miles from San Antonio, will be reached by March 1.

Schuylkill & Lehigh Valley.—A merger and consolidation has been effected with the Pottsville & New York road. It is expected to have a new road opened from Schuylkill Haven, Pa., to Lehigh Gap by August.

Shenandoah Valley.—This road is delivering the material for its new iron bridge over the Potomac at Shepardstown, Md.

South Atlantic & Ohio.—On the line of this road, which is to run from Estellville, Scott County, Ky., to the State line, the principal grading has been done to Clinch River, 42 miles. The bridges and the masonry have been completed, all the material for the track has been bought, and most of it is at Bristol. The track is now being laid, and it is expected the road will be put in operation between Bristol and Estellville in April and to Clinch River in June. It will pass through Lee County which has no railroad at present within 20 miles.

Texas & Pacific.—The company has contracted for the raising of the roadbed, leveling and laying with steel rails the entire New Orleans division of the road, between New Orleans and Shreveport, La., about 300 miles. The contractors are Messrs. Rogers & Ballantyne, S. C. Knowlton & Co., and Green & Brogan, and they have agreed to complete the work before August 1, 1887.

Toledo, Cincinnati & St. Louis.—Mr. Kneeland, of Boston, purchaser of this narrow-guage road, having failed to pay certain judgements allowed by a Illinois court, application is to be made for a re-sale in order to pay these judgments as provided by the original decree.

ANNUAL REPORTS.

Lehigh Coal & Navigation Co.

This company owns a line from Phillipsburg, N. J., to Union Junction, Pa., 105 miles, with branches and leased lines of 74 miles; a total of 179 miles. The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886.	1885.	Inc. or Dec.	P c
Receipts	$1 728.507	$1,984 676	D. $256.169	12 9
Expenses	1,108,486	1.119,027	D. 10,541	0.9
Net income	$620,021	$865,049	D. $245,628	28.3

From the net income deduct $89,418 for coal sinking fund; two dividends, one of 2½ per cent. and one of 2 per cent., amounting to $570,408; total, $659,826, decreasing the surplus by $39,805.

Delaware, Lackawanna & Western.

This company owns a line from the Delaware River to the New York state line, 115 miles, with branches of 96 miles. It leases and controls 678 miles of road in New York and New Jersey. The statement is for the year ending Dec. 31. The income account for the year was as follows:

	1886	1885.	Inc or Dec.	P. c.
Earnings	$32,342,865	$31 091 677	I. $1,251,188	4 0
Expenses	24,954.433	23 220,572	I. 1,733 861	7.4
Net earnings	$7,388,432	$7,871,105	D. $482,673	6.1
Int. re t and new equipment	5.350,740	5,630,271	D. 279.531	4 9
Net profit	$2,037,692	$2,240,834	D. $203,142	9.0
Per c nt. of exps.	77.1	74.7	I. 2.4	

The coal transported last year was 7.164,329 tons, against 6,711,634 in 1885, an increase of 452,695 tons, or 6.7 per cent

Northern Central.

This company owns a line from Baltimore, Md., to Sunbury, Pa., 136.8 miles, with 51 3 miles of branches and 192.8 miles of leased lines, a total of 380 miles.

The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886	1885	Inc. or Dec.	P. c.
Earnings	$5,474 617	$5,490 922	D. $16,305	0.2
Expenses	3,542.668	3,255,614	I. 287.054	8.8
Net earnings	$1,931.949	$2,235,308	D $303,359	13.5
Gross earn. p mile.	14 407	14.450	D. 43	0.2
Net " "	5,084	5,882	D. 798	13.7
Per cent. of exps	65.1	59.2	I. 5 9	

Receipts from other sources last year were $277,348, making the total net $2,209,297. Interest, rentals and dividends being paid, the amount carried to profit and loss account was $994,760. The earnings show a loss of 0.2 per cent. gross and 13.5 per cent. net.

Milwaukee & Northern.

This company owns a line from Schwartzburg, Wis., to Pike, Wis., 176 miles, with 59 miles of branches, a total of 235 miles. The statement is for the year ending Dec. 31.

The earnings for the year were as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings	$646,226	$561,260	I. $84,966	15.1
Expenses	414,142	385,488	I. 28,654	7.4
Net earnings	$232,084	$175,772	I. $56,312	32.0
Gross earn. p. mile.	2,750	2,383	I. 367	15.4
Net " "	987	748	I. 239	31.9
Per cent. of exps.	62.5	68.6	I. 6.1	

The interest and rentals last year amounted to $200,961, leaving a surplus of $31,123 for the year, a gain over last year of $3,361.